Vol. 127. Number 9 NOVEMBER, 1927 Price 25 Cents

AMERICAN GAS JOURNAL

Established 1859 Pioneer of the Gas Industry

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"ABILITY TO SERVE"

STACEY BROS. GAS CONSTRUCTION COMPANY

Cincinnati, Ohio

New York - Boston

GAS PLANT ENGINEERS

BUILDERS OF

SAFE - ECONOMICAL

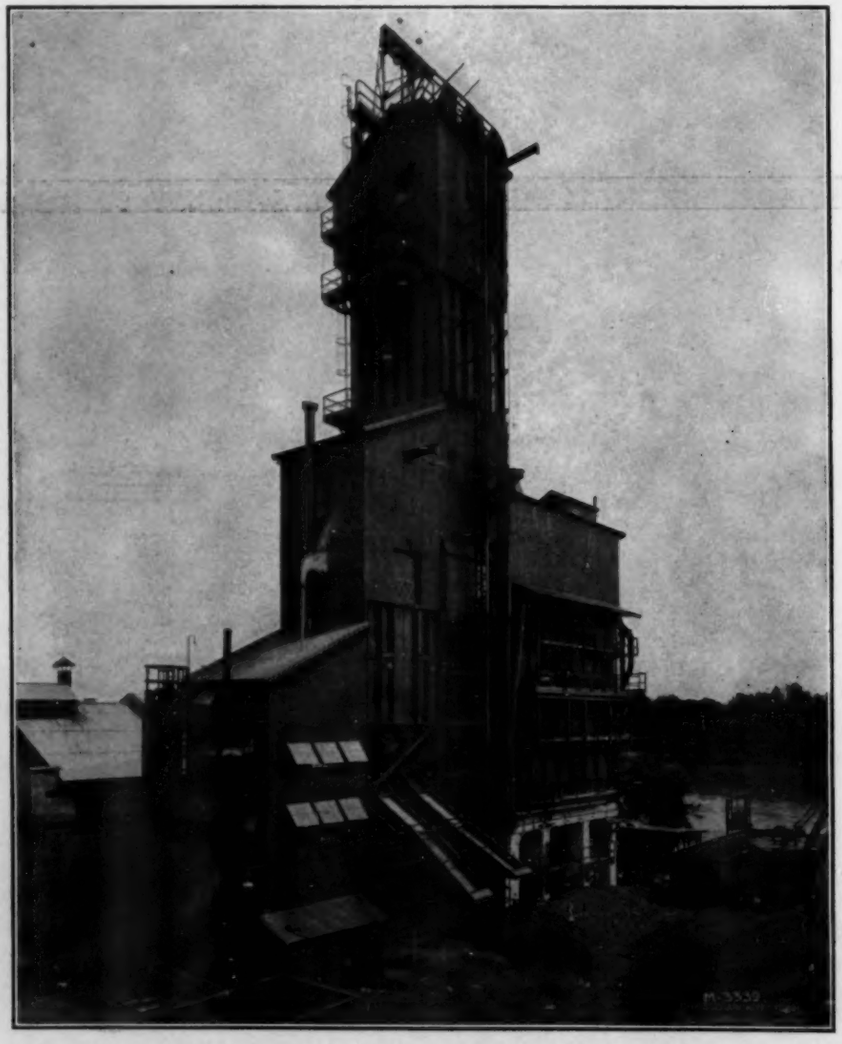
PERMANENT

GAS HOLDERS

The Stacey Brothers are the Pioneer Gas Holder Builders of America.

111

A. G. A. CONVENTION REPORT NUMBER



KOPPERS CONTINUOUS VERTICAL COMBINATION OVEN PLANT
OF THE
ILLINOIS NORTHERN UTILITIES COMPANY
STERLING, ILLINOIS

The Koppers Construction Company

Designers and Builders of
BY-PRODUCT COKE AND GAS PLANTS

Chicago Pittsburgh New York

Vol. 127. No. 9 Whole Number 3647

American Gas Journal

Sixty-Eighth Year

November, 1927

Published Monthly by American Gas Light Journal, Inc., 53 Park Place, New York, N. Y.

S. G. KRAKE, Pres. and Treas. A. M. GLEASON, Sec'y.

H. M. RILEY, Editor

THE CONVENTION REPORT

In this issue a painstaking attempt has been made to give a more or less detailed report of the convention procedure. However, it was not found possible, due to lack of editorial space, to treat any subject in its entirety.

There was much that transpired at the convention that can well be considered of major importance, and accordingly it is quite likely that several additional reports could be written, each equal to or better than that in this issue.

In the main it has been our idea to include in one issue the high lights of the Chicago meeting and "clear the decks" for further editorial activity in the succeeding current issues.

We desire to thank those who have labored with us in our endeavor to accomplish our purpose.

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Built for North Carolina Public Service Co., High Point, N. C. Similar Installations Constructed at Winston-Salem, N. C. (2); Orlando, Florida (2); Burlington, N. C.; Greensboro, N. C.; Allegan, Mich.; Plainville, Mich.; Kingston, N. Y.

HIGH PRESSURE TANKS

50,000 CU. FT. OF GAS STORAGE AVAILABL E BETWEEN 5 LBS. AND 50 LBS. PRESSURE
WE BELIEVE OUR QUOTATIONS WOULD INTEREST YOU

Gas Plant Equipment - Gas Holders - Purifiers

THE STACEY MANUFACTURING COMPANY

ENGINEERS AND BUILDERS

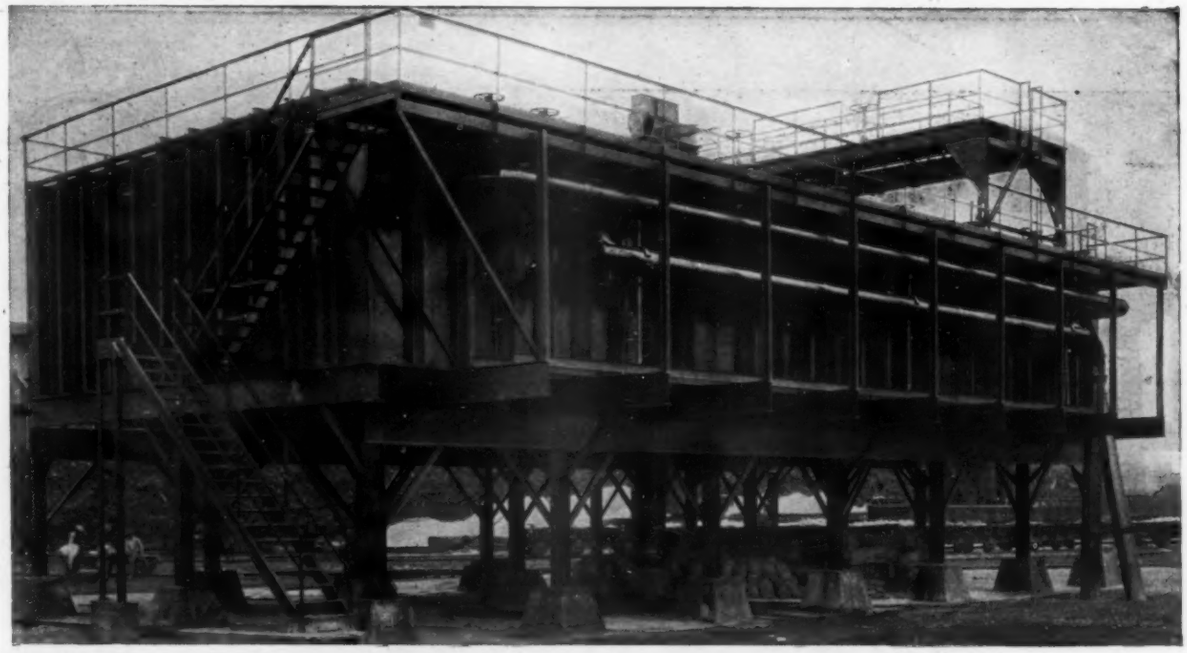
J. FRANK STACEY, President and General Mgr.
GEO. H. CRESSLER, Gen. Sales Mgr.
T. C. RANSHAW, Vice-President
W. D. BIRBECK, Sales Engineer
A. E. HARVEY, Sales Engineer
EDW. J. BAECHLE, Secretary and Treasurer
FRANK O. PANDORF, Chief Engineer

THE BUILDERS OF STACEY GAS HOLDERS FOR SEVENTY-SIX YEARS

CINCINNATI, OHIO

NEW YORK OFFICE: 52 VANDERBILT AVENUE

Steere Welded Purifiers



Welded Steel Purifier Built for the Otis Steel Company, Cleveland

The preference throughout the gas and by-product industries for the Steere Purifier is not merely because of its nominal first cost.

Its sturdy welded construction guarantees tightness against the severest tests and strains.

Doors and door-handling equipment are designed to permit rapid replacing of oxide.

Oxide trays of selected lumber are built to permit free passage for gas and to prevent wedging of purifying material.

Steere valves and welded steel manifold piping assure perfect control of the equipment and give years of service.

SEMET-SOLVAY
ENGINEERING CORPORATION
Division Allied Chemical and Dye Corp.
40 RECTOR ST. NEW YORK

45 Years of Progress

1882 U G I 1927

Forty-five years of progress and accomplishment stand back of U. G. I. organization, forming background for the service it rendered the gas industry.

With far-sighted vision and j ment it has always led the wa ward perfecting the art and ra the process and operating stand from the low level of the old house to the present efficient erating or carbonizing plant.

In addition to developing and i ducing practically every impor device and improvement used i carburetted water gas industry day, U. G. I. research work benefited the industry far mor value than dollars and cents can resent.

OUR HOME

Under one roof, in this splendid structure comprising 430,000 square feet of area, the entire space is devoted exclusively to the uses of the U. G. I. organization.

The U-G-I-CONTRA

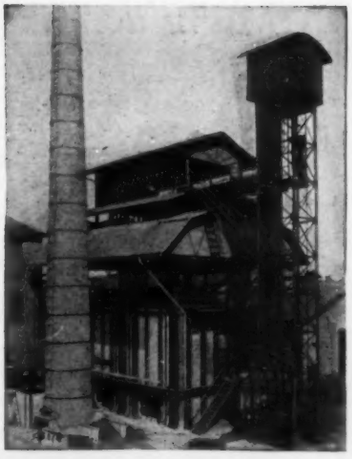
421 Peoples Gas Building, Chicago — BROAD & ARCH STS PH

...nd Accomplishment.

The U. G. I. has engineered, designed and installed about 1,100 sets of carburetted water gas apparatus with a daily capacity in excess of 1,250,000,000 cu. ft., or 450,000,000,000 cu. ft. per annum, if they were all operating; also 141 waste heat boilers for the conservation of sensible heat from water gas apparatus and carbonizing plants; 237 automatic controls for the efficient operation of water gas apparatus; 30 installations of Cottrell Electrical Tar Precipitators, and 42 Pier Processes for soft coal operation—both improved developments of a comparatively recent date.

The new U. G. I. Intermittent-Chamber Ovens are now being introduced, with the first installation being made for the Key City Gas Company, at Dubuque, Ia.

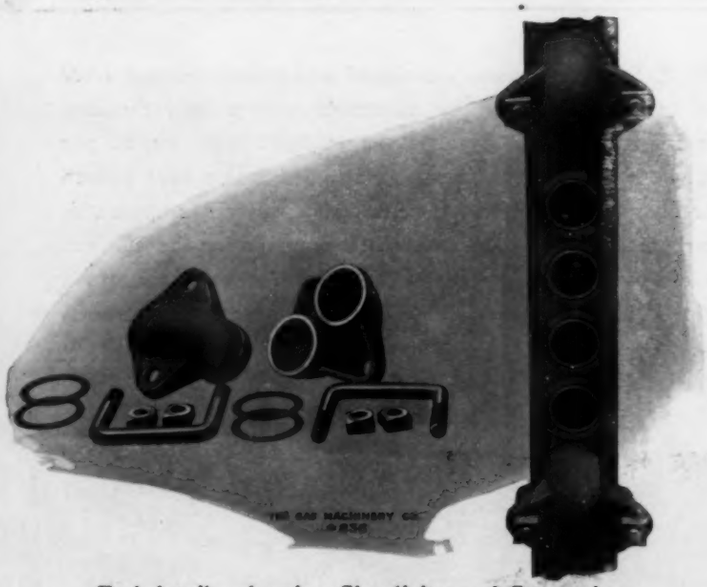
The U. G. I. Contracting Company activities are by no means limited to work within the gas industry. There are distributed from New England to Texas monuments to its engineering skill and construction ability in the form of Locks and Dams, Hydro Electric Stations, Steam Power Stations, Bridges and Viaducts, Industrial Buildings, High Tension Lines and other varied works.



...CTING COMPANY

PHILADELPHIA — 1419 Healey Building, Atlanta

Complete Gas Plants



End details, showing Simplicity and Strength

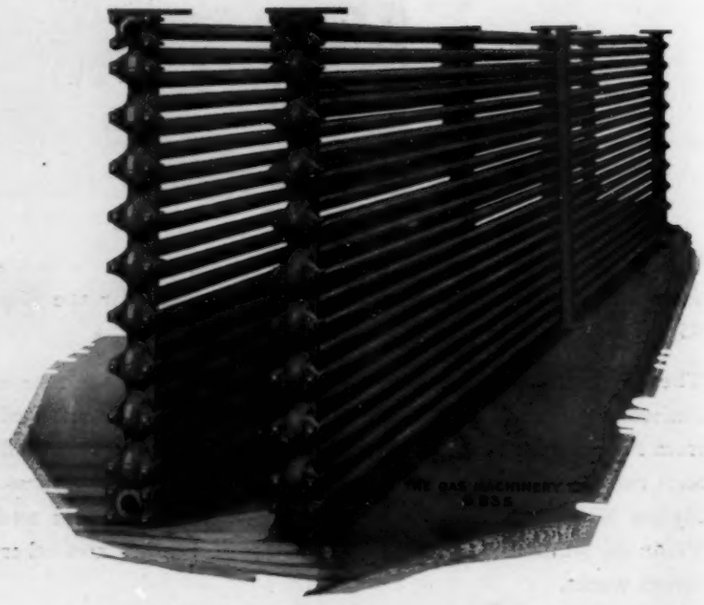
COOLING COILS

With 2-inch Tubes

Patent Pending

We also Design and Manufacture:

BENCHES,
BY-PRODUCT GAS OVENS,
PURIFIERS,
AMMONIA CONCENTRATORS,
TAR EXTRACTORS,
VALVES AND CONNECTIONS,
WASHERS



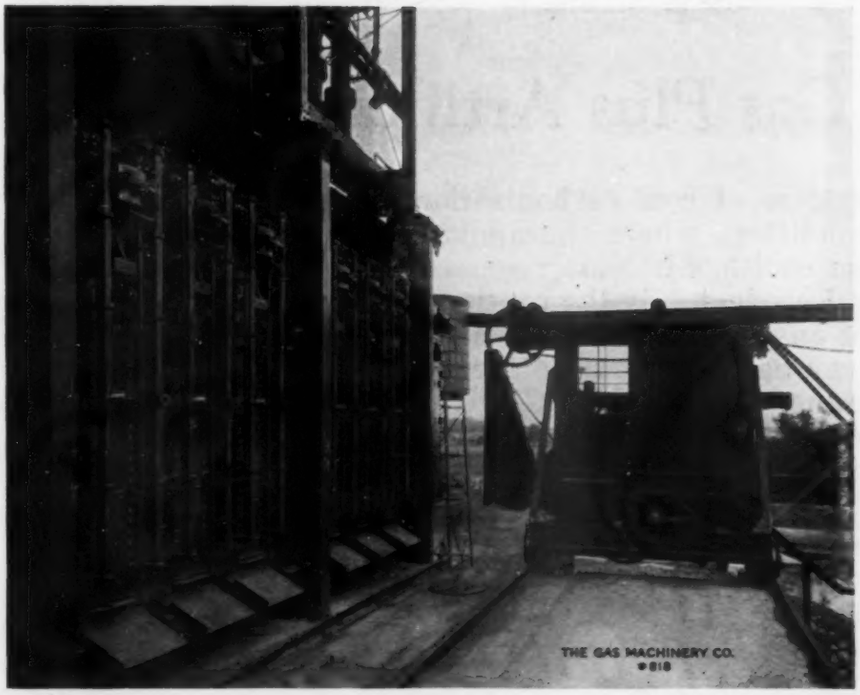
Assembled Coils—Full area of pipe in bends.
Built 20 to 40 Tubes high.

THE GAS MACHINERY COMPANY

- Special Machinery

GAS OVENS

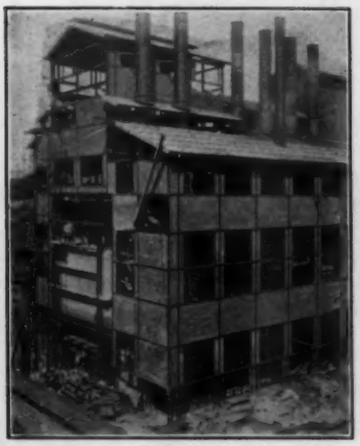
View to right shows Top of Oven Battery



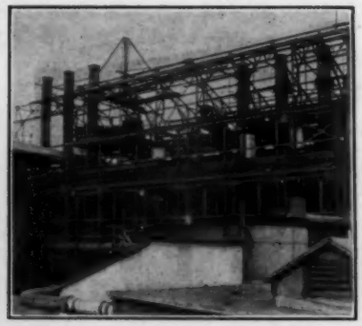
This view shows the Pusher Side of Ovens

- - - - CLEVELAND, OHIO

GLOVER-WEST
Vertical Retorts



PAWTUCKET, R. I. (Ext.).
1,060,000 cu. ft. per day.



SPRINGFIELD, MASS. (Ext.).
2,500,000 cu. ft. per day.

SOME OF THE
GLOVER-WEST PLANTS
NOW BEING BUILT

FARIBAULT, MINN.
400,000 cu. ft. per day.

Natural Gas Plus Artificial Gas

The Glover-West system of coal carbonization is peculiarly well adapted to such conditions where the addition of plant for the making of gas from coal has become necessary due to lessening supply of the natural product. By the continuous steaming of the retort charge gas of any desired calorific value within wide limits may be made, and can be readily varied from time to time as the natural product become less available. Glover-West retorts get the utmost out of the coal and give a constant volume of gas from hour to hour of constant quality.

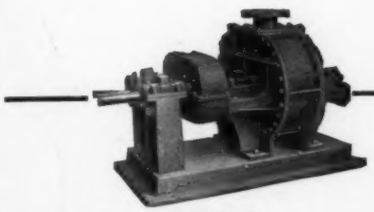
WEST GAS IMPROVEMENT CO.

Builders of Coal Gas Plants

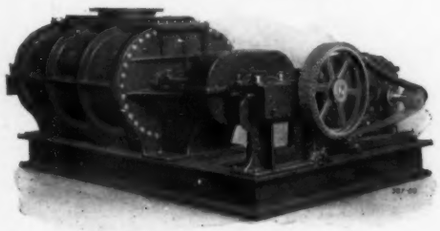
441 Lexington Ave. New York.

Better Service to New Residence Sections

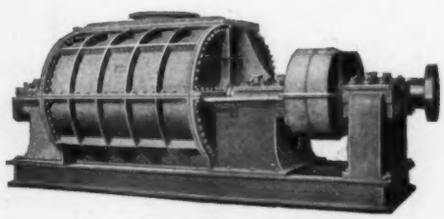
without laying larger mains is possible if you use Connersville Positive Boosters



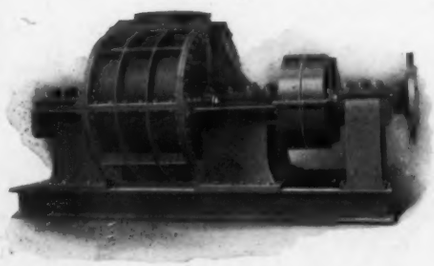
Small 10 lb. Booster



Medium Capacity Motor Driven Booster



Large Gas Pump for connection to engine



High pressure Booster with coupling for direct motor drive

The growth of our cities and the building up of new residential districts has placed a problem before the gas companies. The people who move into their new homes want the same kind of service that they had in the older part of town. Yet the return to the gas company will not justify the expense of digging up the small mains and laying larger ones.

That problem can be solved by installing Connersville Rotary Positive Boosters to force more gas through the same mains. Moderate pressures of 4 or 5 lbs. will let you use the old pipes and still supply enough gas.

The cost of equipment, chargeable to capital, would be moderate and the operating expense would be low for Connersville Gas Pumps are economical in power consumption and in up-keep.

Ask us for quotations and operating data on a booster for your distribution system.

Have you a copy of Catalogue 22?

The Connersville Blower Co.

12th St. and Columbia Ave.

Connersville, Indiana

Sales Offices
114 Liberty Street
New York

53 West Jackson Blvd.
Chicago

604 Chamber of Commerce Bldg.
Pittsburgh

Eastern Service Co.
Boston

The Connersville Blower Co.
Connersville, Indiana

Please mail me Catalogue 22 telling about Connersville Gas Boosters.

Name .....

Company .....

Address .....

.....

.....

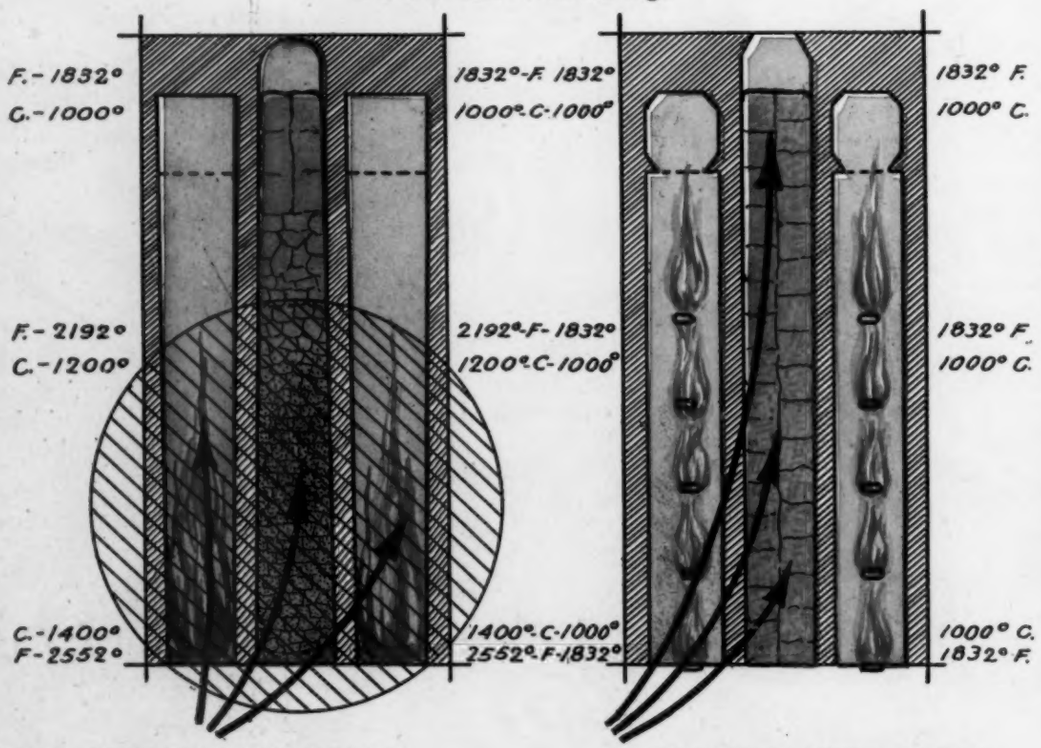
CONNERSVILLE

Blowers • Gas Pumps • Meters • Cycloidal Pumps

THE PROOF!

Showing the Efficiency of the STILL SYSTEM of MULTI-STAGE COMBUSTION

The demonstration plant, as indicated below, has been in operation for the past six months and is 19 feet 8 inches high



THE COMMON ONE-FLAME METHOD

Note how combustion is practically limited to lower 5' to 6' 6", and only occasional tips of flame reach 7' 6".

—and then—

THE CARL STILL MULTI-STAGE COMBUSTION SYSTEM

Note how in the Still System the heating gas is stretched over the entire height of the heating flue—19' 8".

Furthermore—A 40% throttling of the volume of heating gas did not in the least affect the uniformity of the Still System, while the one-flame process was confined to parts in the immediate vicinity of the sole of the flue.

Other strong points of the Still System are:
Excessive Heating eliminated. Utmost protection of Distillation Gases. Highest yield in By-products, and Free Flowing Tar. Fastest operation of ovens and largest possible thruput. Lowest consumption of fuel gas. Unlimited oven height. Maximum safety and minimum labor requirements in operation. Greatest efficiency.

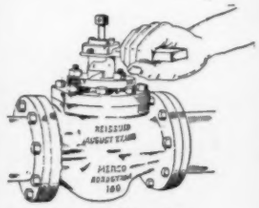
Let our Consulting Engineers give further details

CARL STILL CORPORATION

114 LIBERTY STREET, NEW YORK

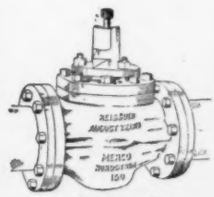
Merco Nordstrom VALVES *Won't leak* AND *Won't stick*

No Trouble from Sticking



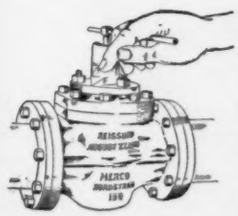
If Stuck

If, after long disuse the Valve seems stuck, it requires no drastic wrenching.



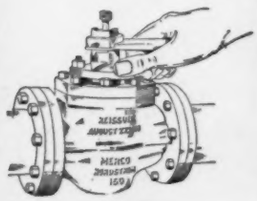
Greased

A stick of special Merco lubricant is inserted.



Turn Lubricating Screw

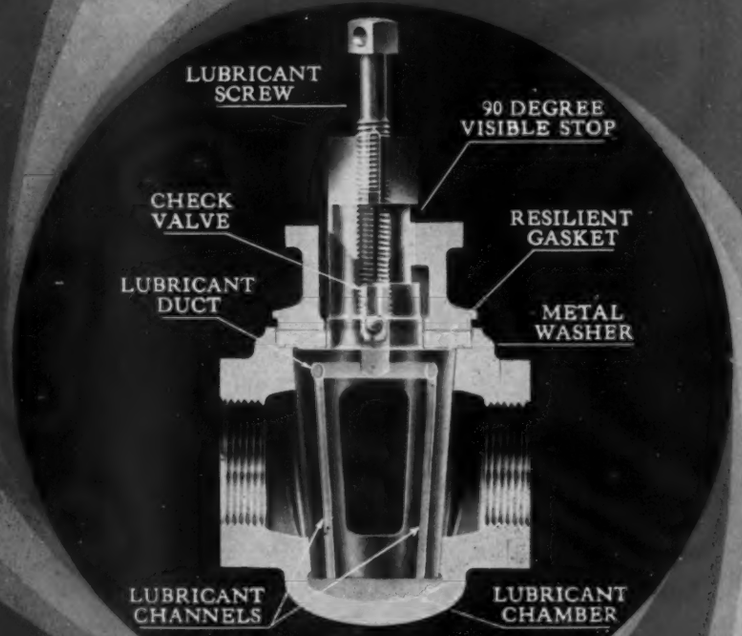
Hydraulic pressure of up to 2000 pounds per square inch is exerted upon the plug, by merely turning the screw.



Open

The Valve can then be easily opened or closed, without exertion.

Special Merco lubricants in stick form have been compounded for different operating services—to maintain the proper body and film at varying temperatures and in contact with different kinds of gases, acids and solutions.



In the gas industry the lubricated plug valve was unknown a few years ago. Leaks had to be tolerated. Stuck valves were more the rule than the exception. Then Merco Nordstrom Valves were introduced and valve service was revolutionized. The principle of lubricant under pressure—to guard the plug against sticking, corrosion and leaks—was enthusiastically accepted.

Ask for descriptive catalog.

MERCO NORDSTROM VALVE CO.

SUBSIDIARY OF THE MERRILL COMPANY

Engineers—

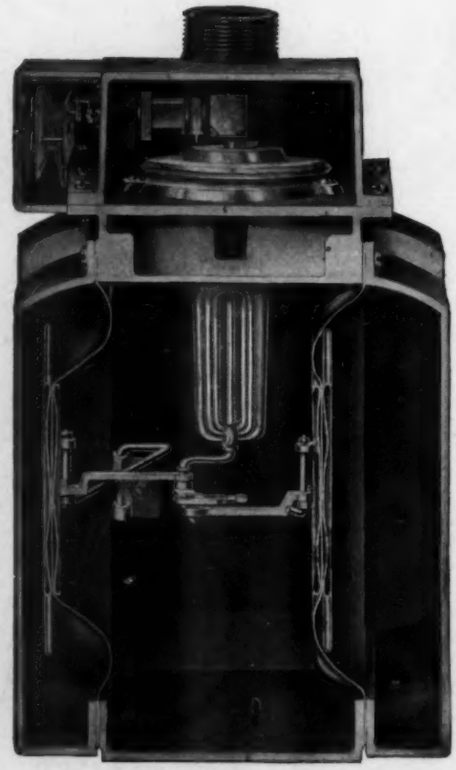
San Francisco, 121 Second St.
Chicago, Peoples Gas Building
Cleveland, Ohio, 125 Engineers Building
Western Factory: Oakland, California

MERCO

Manufacturers

New York, 11 W. 42nd St.
Houston, 1315 Petroleum Bldg.
New Orleans, 1501 Masonic Temple Bldg.
Eastern Factory: Belleville, New Jersey

AGENCIES IN PRINCIPAL CITIES



Sprague Standard Meters

for
accurate
pilot light
measurement

Sprague Standard Meters represent over twenty years of progress

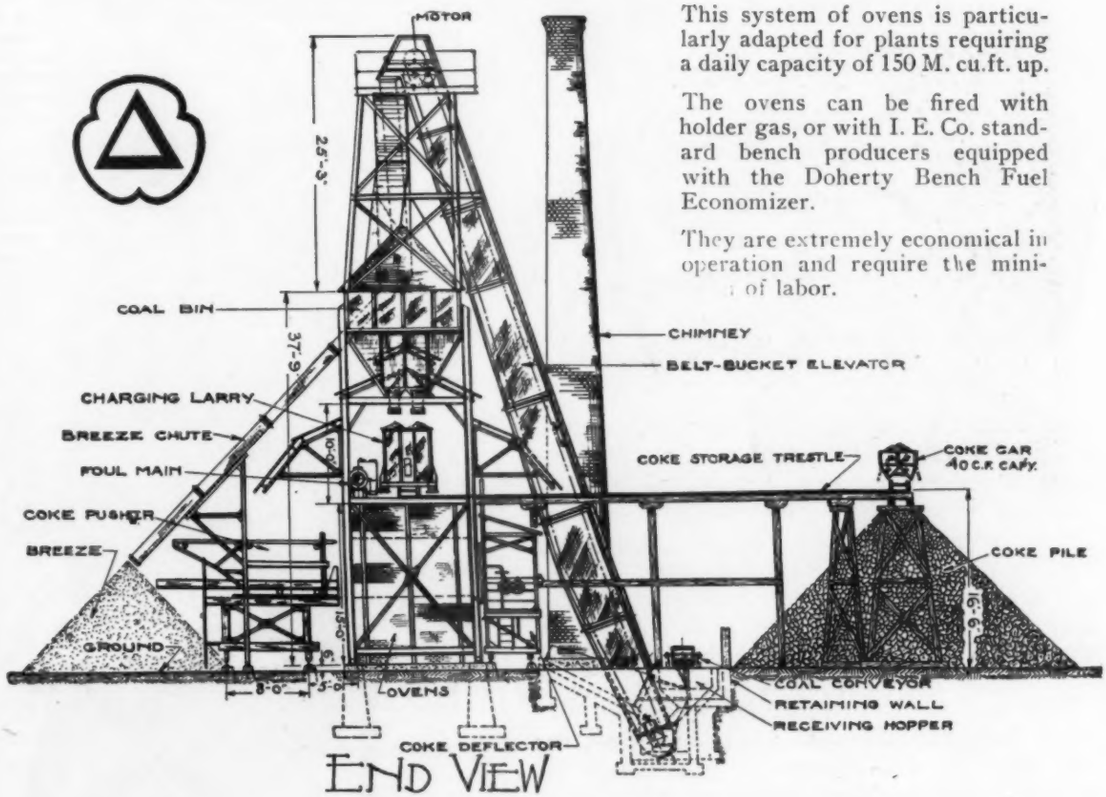
Write for Bulletin No. 10

Sprague Meter Company

Bridgeport Conn.

The UNIT TYPE
HORIZONTAL GAS and COKE OVENS

Developed primarily to meet the requirements of the small and medium size gas plants



This system of ovens is particularly adapted for plants requiring a daily capacity of 150 M. cu.ft. up.

The ovens can be fired with holder gas, or with I. E. Co. standard bench producers equipped with the Doherty Bench Fuel Economizer.

They are extremely economical in operation and require the minimum of labor.

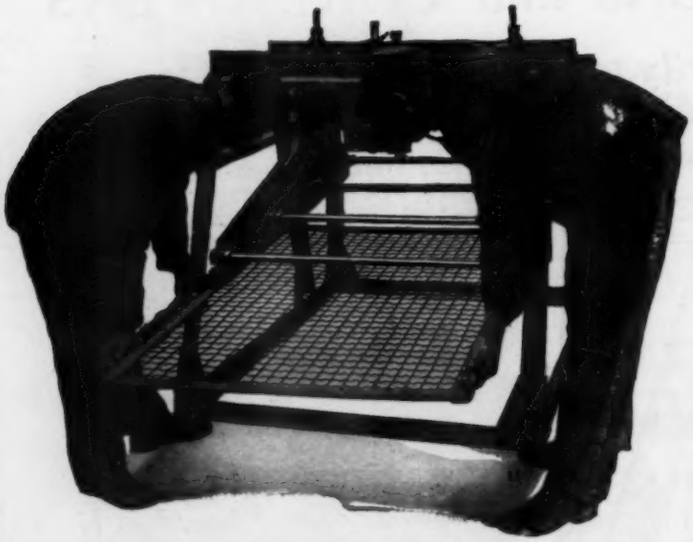
This model, which reflects the achievements of our "Improved" HORIZONTAL GAS OVENS under a new form, is described in detail in a special bulletin sent on request.

An enlarged lay-out of the UNIT TYPE ovens was displayed in our booth at the Chicago Convention

THE IMPROVED EQUIPMENT COMPANY

24 STATE STREET *Engineers-Builders* NEW YORK CITY

The MITCHELL ELECTRIC VIBRATING SCREEN



Showing ease and rapidity of withdrawing and replacing the screen section.

Fifteen minutes' time and the services of two men are all that is needed to change the screen cloth on a Mitchell; no chain block is necessary. Screen cloth for the Mitchell does not have to be bought in specified lengths with specially prepared ends, but can be purchased in the roll and cut as desired, thereby enabling a supply to be kept in stock for emergencies.

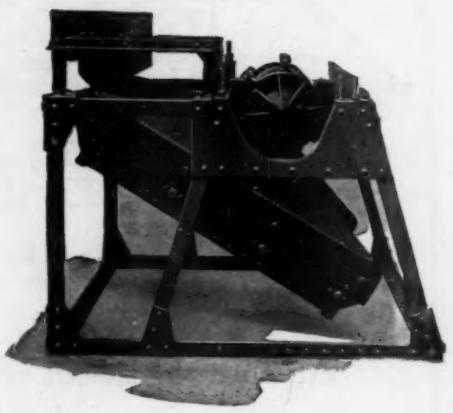
Below—Side view of a double deck screen with feed hopper. This view shows the easy accessibility of the ends of the vibrator as well as the eight screen tightening nuts, which makes it possible to adjust cloth tension while screen is running.

The Mitchell Improved Vibrating Screen is the final answer to the problem of re-screening coke successfully and economically. The Mitchell Screen vibrates 60 times a second, imparting to the screen cloth two distinct motions, the first being a circular motion—which throws the cloth up into the material to be screened—and the second a side sifting motion, similar to that of the old-fashioned hand shaking screens.

These two motions occurring simultaneously form the peculiar motion which has made the Mitchell Screen so effective; and although the screen vibrations are produced with great rapidity the supporting frame is practically vibrationless.

WE DESIGN AND BUILD:

Industrial Railways, Automatic Railways, Cable Railways, Cars, Tracks, Switches, Motor Cars, Scales, Conveyors, Skip Hoists, Electric Vibrating Screens, Cut-off Valves, or Gates, Weighing and Measuring Devices, Coal Crackers, "Stevedore" Transmission Rope and Hoisting Rope, and the "Flotograv" (Coke Reclamation System).



Representative Gas and Coke Companies are rapidly adopting the MITCHELL SCREEN

C. W. HUNT COMPANY, Inc.

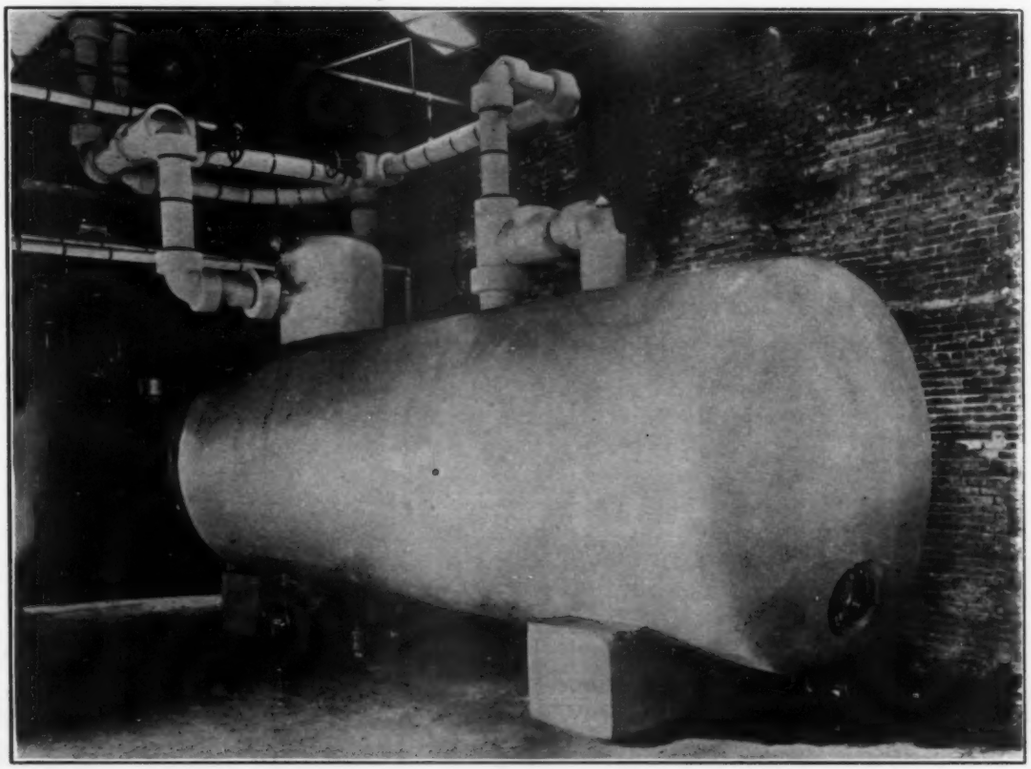
West New Brighton, Staten Island, New York

PHILLIPS LANG & CO., Inc.
431 S. Dearborn St., Chicago, Ill.

ENGINEERING EQUIPMENT CO., Ltd.,
358 Beaver Hall Square, Montreal.

ERNEST F. LEARNED
141 Milk St., Boston 9, Mass.

SMOOT STEAM ACCUMULATOR



Smoot Steam Accumulator and Control System
Concord Gas Co., Concord, New Hampshire
The U. G. I. Contracting Co., Engineers and Constructors

New Smoot Installations Under Contract

Hudson Valley Coke & Products Corp., Troy, N. Y.
Semet-Solvay Engineering Corp., Engineers.

Brooklyn Union Gas Company, Brooklyn, N. Y.
The Bartlett Hayward Co., Engineers

Consolidated Gas, Electric Light & Power Co. of Baltimore

City Gas Co. of Norfolk, Norfolk, Va.
Stone & Webster, Engineers.

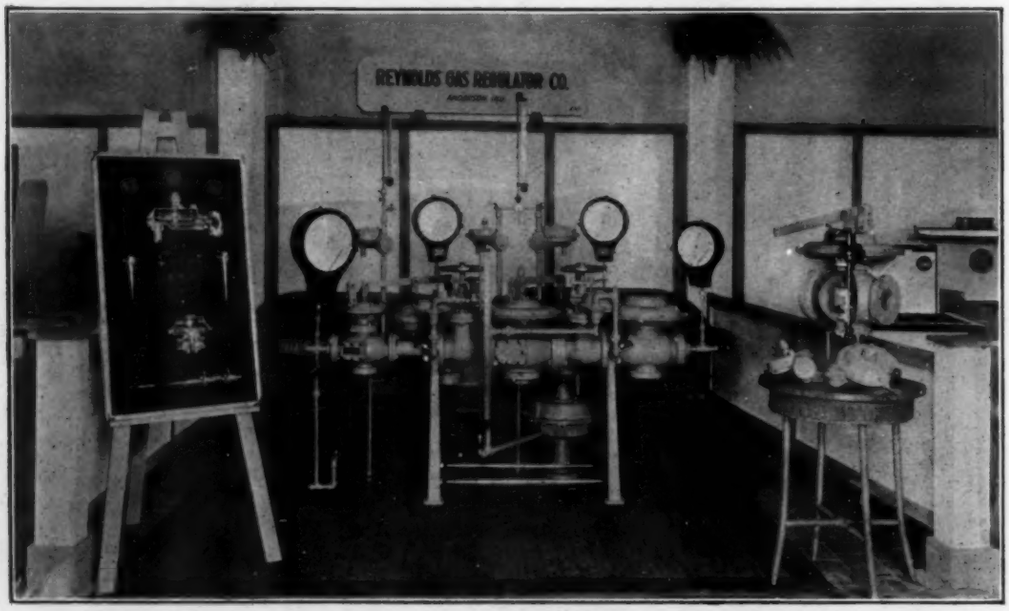
Nassau & Suffolk Lighting Co., Hempstead, Long Island.
E. L. Phillips & Co., Engineers.

Detroit City Gas Co.
Station B Plant, Detroit, Mich.

SMOOT ENGINEERING CORPORATION
136 Liberty Street **New York**

At the Convention—

The Chief Topic of Conversation was the Reynolds Unique Exhibit



AT THE CONVENTION manufacturers proudly unveiled the results of a year of progress . . . What's New? What's Improved? What of the Future? . . . As far as Regulators are concerned, the answer to these questions is the REYNOLDS GAS REGULATOR . . . bringing new efficiency! New economy! New methods of standardization! Such was the endorsement by hundreds of members in attendance.

For those few members who were unable to attend the biggest gas convention ever . . . the Reynolds display consisted of six life-size regulators in actual operation. Hooked up with 80 pounds pressure the first unit cut this to 9 pounds pressure, after which it was passed through a single district governor reduced to ten inches water column and this in turn was reduced by an Intermediate Pressure Governor to four inches water column. Three New Model 10 Regulators worked on pressures of 80 lbs., 9 lbs., and 10 inches, respectively.

Reynolds Products

for all kinds of Pressure Reduction —for either artificial or natural gas.

Governors—
- Intermediate Pressure
- Triple Outlet
- Holder
- Toggle Type Street

Regulators—
- High Pressure Service
- Low Pressure Service
- Intermediate Pressure
- High Pressure Line
- Single and Double District Station

Valve—
- Automatic Quick-Closing Anti-Vacuum

Comments heard at the show—

Many features far in advance of anything on the market . . . The new valve stem for stations—just what we have been looking for . . . More than a step ahead . . . Remarkable performance of working exhibit . . . Standardization of working units will increase efficiency in our service . . . Reynolds new products work in the field as well as when demonstrated.

Reynolds
Gas Regulator Company
Anderson, Indiana
Established 1892

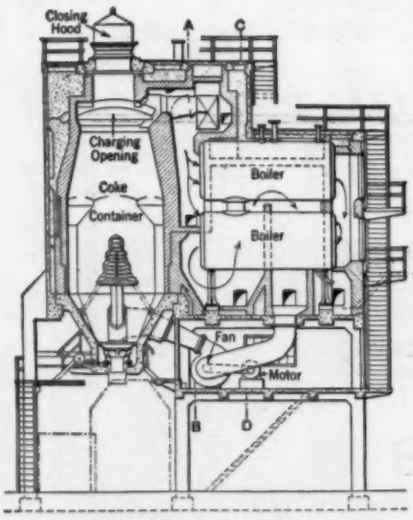
New England Representative: EASTERN SERVICE CO., Boston, Mass.

Gasholders
Condensers
Purifiers
Scrubbers
Tanks
Pipes
Stacks—Flues
Steel Plate Work

CRUSE-KEMPER COMPANY

AMBLER, PENNA.

Western Union Code, Cable Address: Cruskemper, Ambler



Diagrammatic view of a Sulzer Dry Quenching Coke plant

Why Dry Quenching?

There are two methods of cooling By-product Coke—

Wet Quenching and Dry Quenching

Let us compare them:

	WET QUENCHING	DRY QUENCHING
1	The heat contained in the glowing coke is entirely wasted.	*The heat of the glowing coke is reclaimed and utilized for steam generation.*
2	The sudden quenching with water splits the coke, thereby increasing the amount of coke breeze and dust.	*Dry Quenched coke is cooled slowly. Hence it is stronger, of better quality and contains less breeze and dust.*
3	Wet Quenched coke contains a large proportion of moisture, entailing increased fuel consumption when the coke is burned.	*Dry Quenched coke is absolutely dry and produces better thermal efficiency in both blast furnace and gas house practice.*
4	In cold weather, difficulties are encountered due to freezing.	*No water used in Dry Quenching—hence there is no freezing.*
5	In regions where the water supply is limited, wet quenching is wasteful and costly.	*There is no water to furnish, pump and dispose of, in Dry Quenching.*

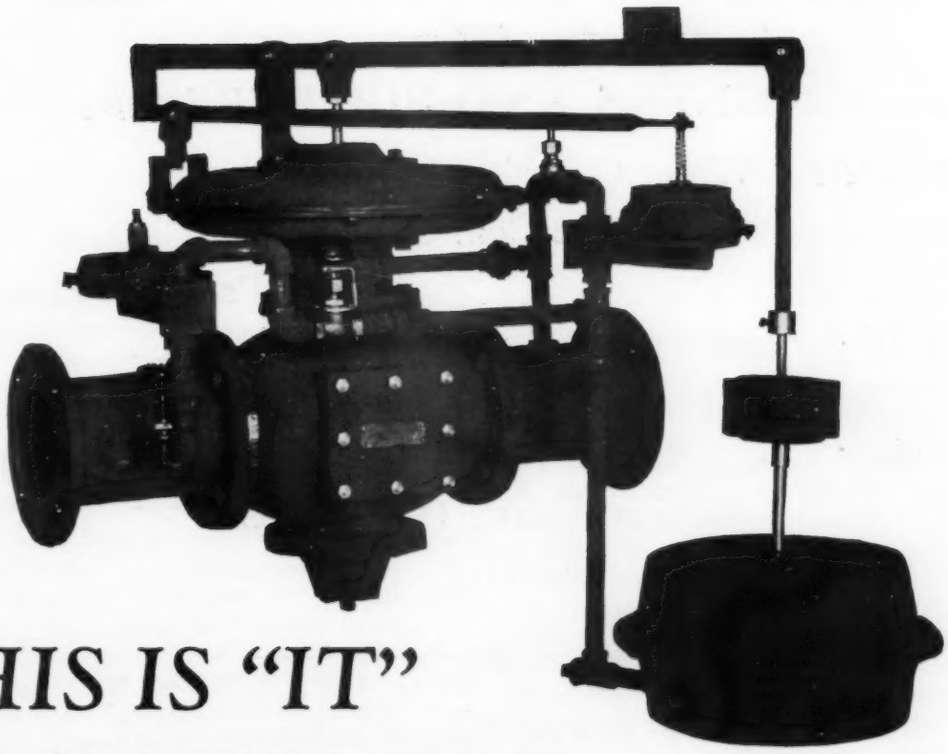
THE Sulzer System for Dry Quenching coke is simple and dependable. The hot coke is charged into a sealed quenching chamber. Inert gases are circulated in a closed cycle by means of a fan, first through the hot coke mass where they absorb the sensible heat of the glowing coke, and thence through a steam boiler where hot gases transfer this heat to the water in the boiler circulation and convert it into steam. Literature describing the Sulzer System will be sent upon request.

Dry Quenching Equipment Corporation

INTERNATIONAL COMBUSTION BUILDING — 200 MADISON AVE. NEW YORK ~ N.Y.

A SUBSIDIARY OF INTERNATIONAL COMBUSTION ENGINEERING CORPORATION

GROBLE
REGULATORS & GOVERNORS



THIS IS "IT"

The New Groble Automatic Regulator that was the sensation of the A. G. A. convention.

Unbelieving thousands saw it demonstrated and were convinced.

It stands alone in the field of achievement and is the latest addition to our complete line.

It is the only regulator on the market that automatically increases and decreases the outlet pressure according to demand.

Thousands saw it demonstrated and asked for literature.

DID YOU GET YOURS?

If not—

Write today for descriptive folder.

Manufacturers of a complete line of regulators for all kinds of pressure reductions— manufactured and natural gas

GROBLE GAS REGULATOR CO.

ANDERSON, INDIANA

Chicago Representative—Utilities Service Co., Peoples Gas Building.
Detroit Representative—H. E. Broughton, 409 Donovan Building.

The BARTLETT HAYWARD CO.

Engineers and Founders

BALTIMORE and NEW YORK

DESIGNERS AND BUILDERS OF:

Carburetted Water Gas Plants

Complete Coal Gas Plants

By-Products Plants

Salt Water and Fresh Water Condensers

De Brouwer Charging and Discharging Machines

Purifiers - Steel Tanks - Shaving Scrubbers

Vertical Waste Heat Boilers

Gas Holders

View of Main Plant, Located at Baltimore

AMERICAN
GAS JOURNAL
Established 1859 Pioneer of the Gas Industry
Including GAS INDUSTRY Est. 1900

HENRY M. RILEY, *Editor*

For the Spirit of Unrest Let Us Be Thankful

A SPIRIT of unrest is evident throughout the gas industry. This reflects the unwillingness of progressive men to be content with the methods of today and their demand for the morrow with more efficient or more economical procedures. It is shown most conspicuously upon occasions like the recent gathering of the American Gas Association where every session made evident the restlessness engendered by progressive spirits.

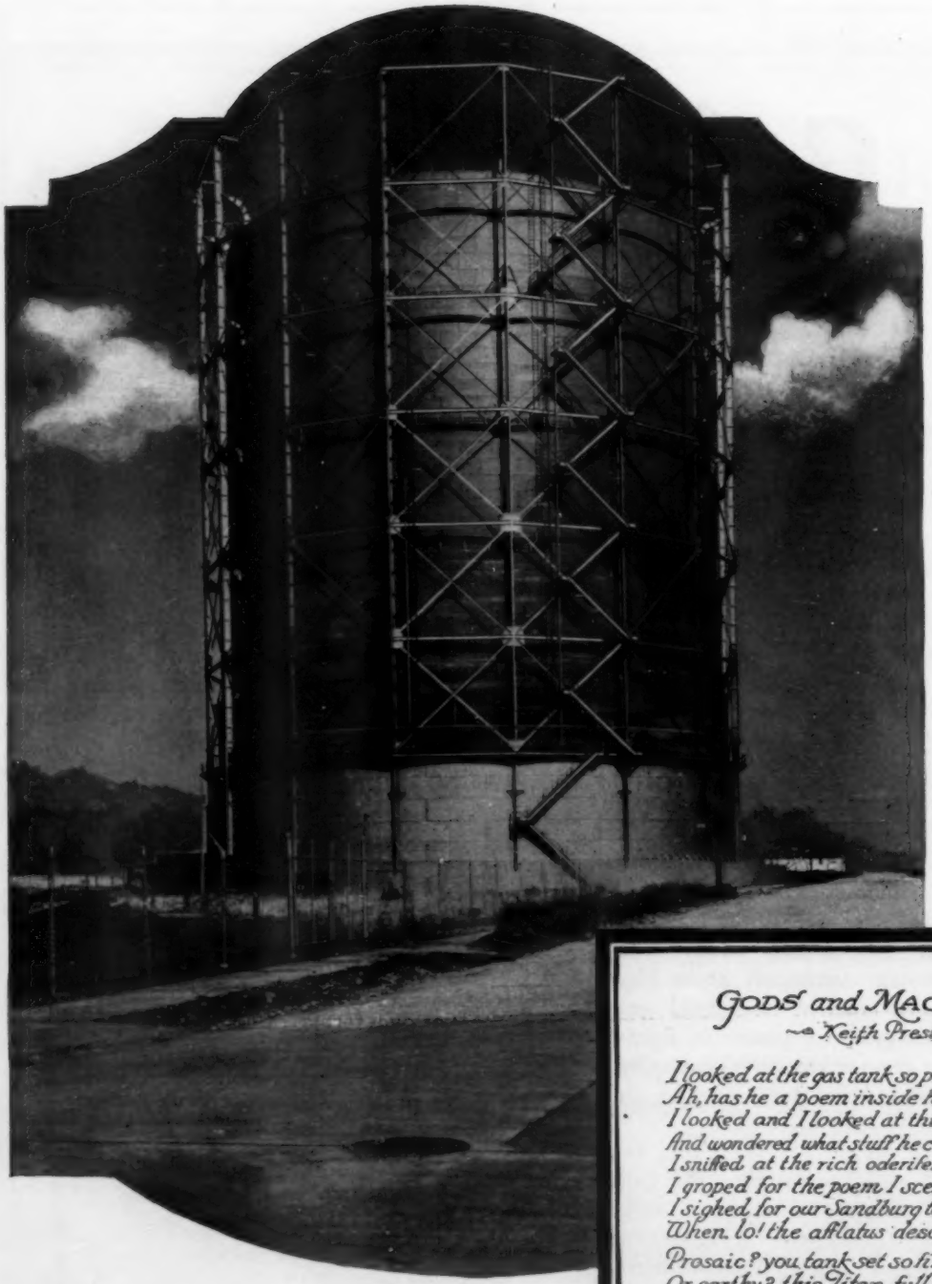
The engineer is constantly demanding more efficient methods of manufacture and new distribution procedures that will lower leakages and permit lower maintenance costs. The commercial department constantly seeks bigger sales and more efficient household gas appliances. The industrial engineer is fighting vigorously for greater industrial-gas sales and for better furnaces and equipment as an aid to this end.

THESE hopeful signs prove that the gas industry is adopting methods of vigorous, independent thinking. If this progressive spirit can be properly guided by executive counsel only good can come from it.

Occasionally there was noted at the Chicago convention a word of caution on the part of the more conservative executives against new and untried ways. In several instances this took the form of a warning against the requirement of new investments. Such warning properly interpreted can well be sounded, for at this time with constant increases in demand for gas there is an amazing demand for enlarged manufacturing and distribution capacity. It is essential that such new investments be carefully scrutinized in order that they may be made only where necessary and then only after thorough investigation as to the intrinsic merits of the various types of equipment available.

THIS needed caution must, however, not take the form of unnecessary conservatism. The gas industry is passing through a time of development and change. The old and inefficient must yield to new and better ways. It is just as important to know when to scrap the old equipment and to substitute the more efficient, as to be able to discriminate between the various forms of new equipment offered. He who retains the old equipment too long is just as much in error as he who mistakenly puts in the inferior machine. New and increased investments are often warranted, even when the old machine may still be useful. Such new investment, when it makes for an increase in over-all efficiency, should not, and with the present "easy" money need not, be delayed.

AT THIS time of national Thanksgiving the gas industry can well count among its blessings the spirit of unrest, the demand for better things, the discontent with old and inefficient ways. He who does not recognize in these things an awakening of the industry and a progressive spirit working for its good is himself not yet fully awake to the opportunities of the day.



GODS and MACHINES

—Keith Preston—

I looked at the gas tank so paunchy and squat—
Ah, has he a poem inside him or not?
I looked and I looked at this funny old card
And wondered what stuff he contained for a bard.
I sniffed at the rich odoriferous air;
I groped for the poem I scented was there;
I sighed for our Sandburg to show me the key,
When, lo! the afflatus descended on me.

Prosaic? you tank-set so firm in the ground?
Or earthy? this Titan, full bellied and round?
We see, Carl and I, O ye rabble myopic,
The heart of this hulk how it throbs philanthropic.
Though blatent his look, what a beautiful soul!
How free with the gains that he squeezes from coal!
How lavish from sweetness and light from his gains,
Serving the people with might and with mains.

Ah, yes, he illumines some millions of heaters,
While brass buttoned thousands are reading his meters;
So generous he, with his brightness sidereal,
For Carl and myself (if you know what I mean,)
Can vision the god where you see the machine.
But in justice to Carl I would have you divine,
His gods are not nearly so gaseous as mine.

—Peoples Gas Club News

High Lights of the Ninth Annual Convention of the American Gas Association

by

American Gas Journal Staff

MEETING for the first time as the agency of the entire gas industry, the American Gas Association convened at the Stevens Hotel, in Chicago, October 10 to 14, 1927, for its Ninth Annual Convention and Exhibition.

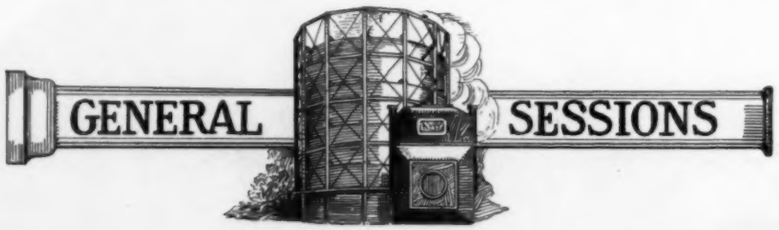
More than thirty-three hundred members and guests were registered upon this occasion and the assemblage included a goodly number of natural gas men. Many of the latter, incidentally, took a prominent part in the program procedure and contributed no small part tc the success of the undertaking which proved to be one well worthy of best and most progressive men of the industry.

In viewing this meeting in retrospect, it becomes increasingly evident that the choice of a city in the Middle West as the place for the convention was a happy thought, in that it was conducive to the gathering together of many men who ordinarily might not have made the trip to some point farther East. Consequently many new and valuable contacts were made while some partially lapsed old ones were renewed and strengthened.

In a great many respects the convention reflected the progressive spirit and up-and-doing attitude of the Middle West and the enthusiasm of the able staff of the Peoples Gas Light and Coke Company, who served as host jointly with the officers and staff of the American Gas Association.

The exhibition staged by the manufacturers was not only attractively carried out but was also quite comprehensive in its scope and served but to impress one with the thought that this feature constitutes an important and necessary phase of such conventions.

There was no lack of well-planned entertainment and diversion which supplies the human leaven so essential to the well rounded success of gas conventions.



A. B. Macbeth
President A. G. A.

"It is the job of every gas company, large or small, to supply its product for every heating purpose in its community—every last one—to which gas can reasonably be applied."

"We must look beyond the domestic load if we would take even a few faltering steps toward making gas the universal fuel."—Samuel Insull.

Blank & Stoller, N. Y.

K. R. Boyes
Secretary A. G. A.

THE prosperous and successful nature of the past year was well shown by the reports of the president, the secretary, and the treasurer, who summarized not alone the work of the Association, but also the progress of the industry as a whole. The treasurer's report showed that the work of the Association has grown amazingly, for the annual budget for the general account now covers a multitude of items totaling between $450,000 and $500,000. There is also the Central Laboratory account for which the annual expenditures now exceed $75,000 and the industrial gas research fund for which nearly $200,000 has been spent or committed.

The membership of the Association has shown gratifying increase, including at the close of the fiscal year, September 30, 675 gas or related companies, 448 manufacturing companies, and 4,639 individuals. In this number are approximately 80 natural gas companies and 1,100 individuals whose membership has been the result of the Natural Gas Association of America with the A. G. A.

Statistical Studies

The report of the secretary-manager emphasized as conspicuous among the Association activities the enlarged work on statistics. In this field the Association has been fortunate in obtaining the co-operation and support of gas companies generally; and in consequence has been able to furnish both within and without the industry an increasingly valuable service as to economic and engineering facts. Outstanding figures developed by the work include:

Annual gas sales (1926)	1,700 billion cu. ft.
Increase in sales over 1925	10%
Revenues	Over $750,000,000
Increase in revenue	$ 68,000,000
Customers served	14,631,000
Population served	70,000,000
Mfd. gas produced or purchased	492 billion cu. ft.
Revenue from mfd. gas sales	$455,000,000
Natural gas mixed with mfd. gas	53 billion cu. ft.
Coke-oven gas purchased for public utility sale	64 billion cu. ft.
Consumption of anthracite coal declined by	37%
Consumption of coke increased by	400,000 tons
Consumption of bituminous coal increased by	1,500,000 tons
Bituminous coal for water-gas making	655,000 tons
Increase in bitum. coal for water-gas making	93%
New manufactured-gas customers	447,000
New miles of main	2,300
Additional meters installed	400,000
Domestic natural-gas consumption	289 billion cu. ft.
Increase in domestic natural-gas consumption	22%
Natural gas gross revenue	$300,000,000
Increase in natural gas revenue	13%
New natural-gas customers	223,000

Presidential Address

In his address at the first session of the convention, President A. B. Macbeth reviewed some of the outstanding activities of the Association year, pointing out in the course of his remarks how this program has been virtually at all points a continuation of the three to five-year program recommended by the Cortelyou Committee and adopted by the Association two years ago. The founding of the Central Laboratory at Cleveland and the undertaking of an extensive industrial gas research program are two of the outstanding projects of the industry. In furtherance of this part of the program the permanent housing of the Laboratory has been arranged for and the continued enlargement of the industrial gas research work, in co-operation with various gas-using industries, has been approved.

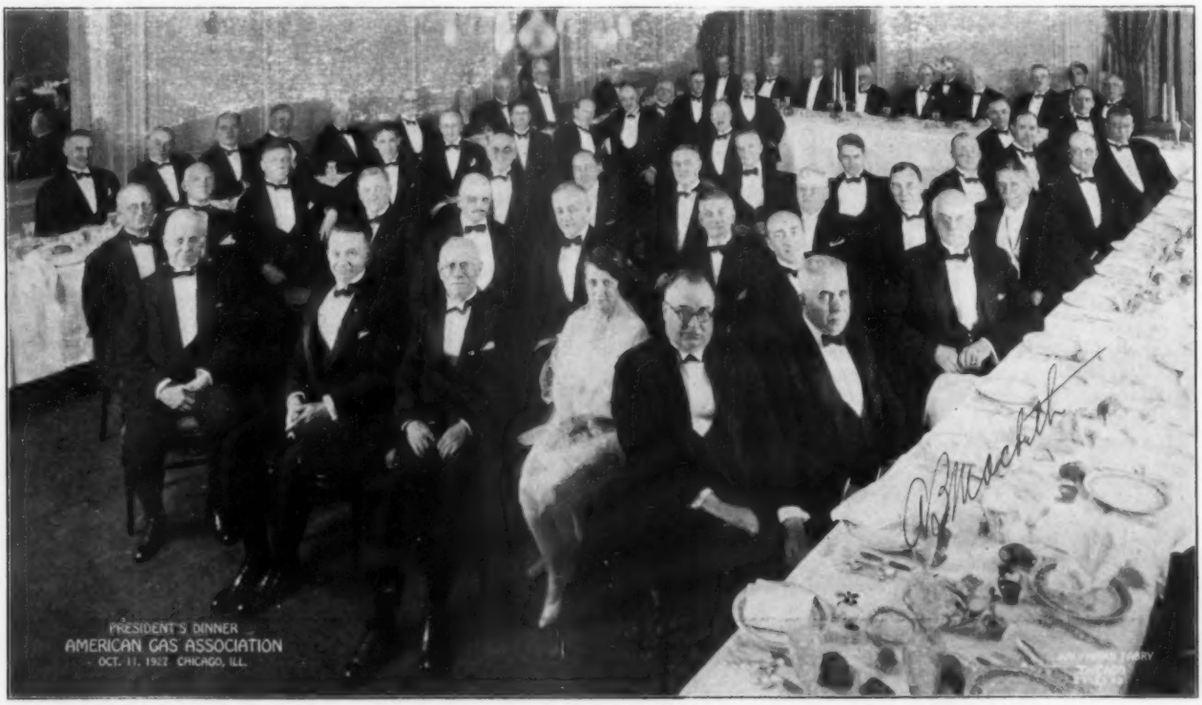
Through consolidation of the Natural Gas Association with the A. G. A., a united program has been undertaken on behalf of the entire industry which is regarded as a particularly appropriate accomplishment during the administration of Mr. Macbeth, one of the outstanding natural-gas engineers of the West. The A. G. A. has also renewed and enlarged the part it is taking in the joint committee of the national utility associations for the information of the public and the protection of the huge capital investments of the utilities of the United States. The national advertising campaign of the Association has been fostered both for the building of good will and for the furtherance of the household "Blue Star" campaign and the increase in industrial gas sales. There has been a considerable increase in the service rendered by the Association in advancing better forms of rates for gas through the rate service bureau, whose facilities are available to all of the industry

Customer ownership of utility companies, through direct marketing of securities, has been furthered by many of the Association members. Returns to the Association from only 91 companies indicate that more than $120,000,000 worth of such securities were sold in 1926 through customer-ownership campaigns. Closer relations with customers were also developed through home-service departments, who are reported by 130 companies to have reached over 8,000,000 women during the preceding year. Educational efforts of the Association have been continued for the benefit of members of the industry through home study courses given by Columbia University to more than 1,200 individuals, by the issuance of new sales pamphlets and through a multitude of other channels.

Economic Survey

The outstanding technical development of the Association year has undoubtedly been the aggressive work done, particularly by the Technical Section, on the "Economic and Engineering Survey of the Gas Industry." The great importance of this project was emphasized by the president, and its scope and purpose explained in detail by former President H. C. Abell, who presented on behalf of the technical men in the industry a review of the entire project.

This undertaking, to get a thorough understanding of the fundamental relations of production and distribution to increasing requirements of gas both for house heating and miscellaneous domestic uses and for industry, is undoubtedly the most important of the present projects of an engineering nature. At



the Chicago convention, only preliminary report could be made, as it is anticipated that the study must continue for at least two years longer, both in the Central Laboratory and through the Engineering and Economic Survey Committee work. The present status of the undertaking is more completely presented under the report of the Technical Section, elsewhere in this issue of the Journal.

Central Laboratory

The importance to the industry of the Central Laboratory at Cleveland was emphasized by an address at the first of the general sessions by Mr. R. W. Gallagher, who has served since its founding as the chairman of the Laboratory Managing Committee. The amazing progress made by this institution is evident from the report that it has examined and approved 6,380 appliances and accessories. It is expected that during the coming year between 50 and 75 per cent. of all appliance sales will be of this approved "Blue Star" equipment.

The work has, however, not been confined to a testing of appliances. It has included very important experimental work required as a part of the engineering and economic survey, particularly upon the behavior in gas-burning equipment of mixed gases of varying composition, varying heating values, and varying specific gravity. Mr. Gallagher reported the important preliminary conclusions that had been reached in this work as to the tolerable limits of variation in specific gravity in mixtures of coke-oven gas and water gas. The details of this work are more fully reported elsewhere in this issue, in connection with a paper by Mr. G. B. Shawn given before the Technical Section.

The Central Laboratory has up to the close of the past fiscal year received in contributions and fees $127,000. Because of the constantly increasing demand for its services it has been found necessary to build a new structure to house the laboratory and $145,000 is to be expended on this building.

1928 Convention

The report of the 1928 Time and Place Committee, recommending Atlantic City at the usual time in October, was enthusiastically approved by the convention.

INSPIRING ADDRESS BY JAMES A. EMERY

It is seldom that the gas industry has had the opportunity to hear a more inspiring address than that delivered by James A. Emery, general counsel, National Association of Manufacturers. His address, "Essentials of Prosperity," was of particular interest to officers and executives of utility companies in general.

Mr. Emery pointed out that one of the broad menaces to prosperity is the effort to put the government into business in competition with private enterprise and endanger the investments of millions of large and small stockholders throughout the entire country. He spoke of the steady encroachments that are constantly eating into national and state taxes to the end that "an unprecedented proportion of the property of the individual is being taken for the purposes of government."

He brought out that our country annually enacts more legislation than is even proposed in all the chief states of Europe taken together; that the last Congress received 23,240 legislative proposals and enacted 808, while receiving and authorizing innumerable investigations by federal boards, bureaus and commissions; that some forty state legislatures maintained an average of between 12,000 and 13,000 new enactments; that the volume alone is a serious menace to stability and certainty, multiplies the cost of business operation, arouses distrust and involves great additional expenditure in the states and nation.

"Serious public anxiety ought to be aroused, not because government is absorbing one-seventh of our gross national income, but because its expenditure approaches one-half of our social surplus. The prosperity of a worker depends upon his saving wage; that of a farmer, upon his surplus, after his expense of operation is paid. It is not the $48,000,000,000 of gross income which represents the capacity of the manufacturing corporations of the United States to render larger social service, but the $4,000,000,000 of net from which alone they improve and develop enlarging capacity. It is not from the $10,252,000,000 of reported gross income that the public utilities of the United States meet the steady pressure for the necessary enlargement of their facilities and the improvement of the quality of their service, but from the $1,468,000,000 of net from which they must first meet $186,000,000 of Federal taxes, a higher percentage of the total than is paid by our financial institutions, with no legal limitation upon their earning capacity."

Mr. Emery told how the Government under various guises had entered such private enterprises as shipping, and is considering such matters as river power development.

He made mention of the fact that the Government is not concerned, as is the private business, with such items as carrying insurance, taxes, overhead, capital losses and the like as applied to itself.

Those Menaced

"It is not a few rich men," said Mr. Emery, "who are menaced by the entrance of government into private enterprise, but the immediate savings of numerous small investors and the ultimate security of fiduciary trusts whose loans underlie the whole structure of that amazing development of energy which has placed more power at the service of the individual American worker than was ever known in the history of man, delivered more cheaply than ever before, here or in any other country.

"American management has committed to it the interest of millions of wage earners and the savings that represent continuing self-sacrifice. In the public utility field you are subject to the strictest regulation and the closest scrutiny. You have upon you the obligation to maintain a high standard of business ethics as the surest means of continuing to deserve and retain the confidence you presently enjoy. To study and correct abuses which you yourself detect,

to discipline by condemnation those within your fraternity who violate its standards, is the surest means of retaining and deserving a high degree of self-government against undue state interference.

"It is impossible to believe that our responsible electorate want bureaucratic administration of utility service, with the teachings of experience before them. There is a simple test of the popular temper:

"What community in the United States, if offered the opportunity, will buy the stock of its own public service corporations at twenty-five cents on the dollar on the condition that their management be determined by popular elections?"

SAMUEL INSULL'S SOUND ADVICE

In his address, "Some Comments on the Gas Industry," Samuel Insull, one of America's foremost utility figures, gave vent to some opinions and ideas that should serve as a guide for the gas industry in mastering its problems and consequently increasing its load under the most favorable conditions.

His opinion was that the gas industry can pattern in many ways from the electrical industry. The high lights of this valuable address follow:

"In my last appearance here much was said about better engineering, about scrapping old ideas and methods as well as antiquated equipment, and about modernizing rate-making and sales promotion. Some of the audience at that time thought my suggestions were unduly drastic. Programs of your subsequent conventions have indicated a large measure of attention to those very problems.

"The statistics of the industry nationally are on the whole gratifying. The total output of manufactured gas now approaches five hundred billion cubic feet per year. Gross sales have increased 352 per cent. in 25 years while the population of the country has been increasing only 50 per cent. We have in the aggregate eleven million customers,—an impressive total when we remember that there is no rural gas service and not much in communities of less than 5,000 population. Total sales per capita have increased more than 70 per cent. in ten years—a figure all the more gratifying because it reflects increased sales per customer as well as an increased number of customers.

"But, encouraging as such figures are, they become a positive handicap if we take them only as an excuse for swelling our chests and our heads and telling the world how well the gas industry is getting along.

"Years ago I used to bore some of my confreres in the electrical industry by preaching on every possible occasion that it was the job of the electric company to supply the energy for every purpose in its community to which electricity could be applied. These electricity supply companies which have taken that as their job have been the leaders in their industry and have contributed most to speeding up its development.

"I can offer the gas industry no better generalized advice than a paraphrase of that same urging. It is the job of every gas company, large or small, to supply its product for every heating purpose in its community—every last one—to which gas can be reasonably applied.

Big Talk Easy

"It is easy to talk big about what we are doing and can do, but not so easy to square performance with it. In our trade literature, there is much about gas as the "ultimate fuel" and the "universal fuel," much about the economic sin of burning coal in a raw state, and so on. But when we tackle the job of correcting this economic sin and making gas the universal fuel, we are apt to work in terms of the kitchen stove and the family water heater.

"Do not misunderstand me as minimizing the importance of the domestic load. It will continue to be the important part of our total load for longer than you or I can estimate, and it will call for corresponding attention continuously. But we look beyond the domestic load if we would take even a few faltering steps toward making gas the universal fuel.

"Our statistical department has made up for me estimates on the total heat requirements of the country and the fuels by which the requirements are supplied, and it has translated them into their equivalents in manufactured gas. These figures, representing the theoretical potential market for gas, are so large as to be meaningless. It should be sufficient to say that manufactured gas is supplying only about 2 per cent of the total heat requirements of the country."

"It is estimated that 20 per cent of the bituminous coal now used could be replaced by manufactured gas. The chief items in this 20 per cent of present bituminous consumption would be as follows: One-half of the bituminous now used for domestic purposes; one-half of that used for industrial purposes, excluding the iron and steel industries; all bituminous used in railroad shops and one-fourth of the remaining railroad consumption except that for locomotive firing.

Sixteen-fold Potential Field

"To this replacement of bituminous coal, and enough gas to replace 75 per cent of the anthracite now used for domestic and industrial purposes, and 75 per cent of the oil now used for house heating and for industrial heat treating. It is estimated that eventually a large portion of the natural gas will be replaced by manufactured gas as the natural gas fields become depleted. Put all of these replacements together and you have a potential market for gas that is within the bounds of possibility and is still about sixteen times greater than the present total output.

"Let us consider only replacement of the coal and oil now used for domestic purposes, including house heating and water heating primarily, and some cooking. Add 20,000 cubic feet per year per domestic customer for refrigeration. This does not seem a dream, in view of the gas using refrigerators already made. These various items will give you a potential market for domestic consumption alone, of approximately fifteen hundred billions of cubic feet per an-

num, or more than three times the present total output of manufactured gas for all purposes.

"If these estimates are not wholly imaginative—and they do not appear to be—the manufactured gas industry, although more than a hundred years old, is still only an infant industry.

"The gas and electrical industries should pull together in ministering to the requirements of other great industries, where they seem to come into competition, as in some industrial heat treating operation, friendly co-operation should uncover the natural line of cleavage between them, an engineering and economic basis, so that each may do the work it can do best.

Gas Industry Can Learn From the Electrical

"Perhaps the gas industry might learn from the electrical industry something of the fundamental economics of massing production and of long distance transmission. The electrical industry has made great progress in this field. I believe development in the gas industry along similar lines is coming.

"With due allowance for distance limitations, I can see no reason why the massing of production in economical plants centrally located, and transmission over considerable areas, should not be quite as feasible for gas as it is for electricity. It is simply a matter of applying competent engineering and accurate arithmetic: engineering to provide adequate production and transmission facilities, arithmetic to uncover and prove the economic factors.

"Study of long distance transmission must lead naturally to a study of the important economics which can be affected by coupling up neighboring gas systems much as electrical systems are tied together by "superpower" development. An interesting by-product of this should be, as in electrical "superpower," the extension of gas service to intervening communities where gas service is now economically impossible.

"Another principle, first learned in the electrical industry, is the influence of load factor and diversity of demand upon the balance sheet. This principle is peculiarly applicable in the gas industry, when load characteristics are adequately studied.

"Take house heating, for example. The house heating peak with us comes in the early morning. The peak of our present total load comes between five and six o'clock in the evening on week days, and at noon on Sundays and holidays.

"On account of this diversity in the hourly demands of the two loads, we find that we can take on house heating to the amount of 40 per cent. of our present total sales for all purposes, with steady improvement in the hourly load factor. Beyond that point, the effect of house heating upon hourly load factor would start the other way. But the hourly load factor of the entire system would not get back to where it is today until the house heating load alone exceeded the total load today for all purposes.

"Of course the year around 24-hour load factor would be reduced by a large house heating load. But if summer loads can be developed in water heating, refrigeration, brick making, cooling of homes, perhaps, and so on, the all-year load factor will be improved. This means that we can afford to take such other seasonal off-peak business at a low rate and utilize otherwise idle production and distribution equipment.

Increasing Industrial Sales Fifty Per Cent.

"Our studies of load charactistics also indicate that we can supply a large volume of gas at low rates to industrial customers who agree to use little or no gas between 10 A. M. and 2 P. M. on Sundays and holidays. This is attractive to industrial users whose plants are always closed on Sundays and holidays. It is attractive to the company because it improves the load factor of the total business. Under such conditions of sale we can increase our industrial sales by 50 per cent of the present total without increasing the maximum one-hour demand on the system, and an industrial load of this size would increase the hourly load factor of the entire system from 32 per cent to 44 per cent.

"In my judgment, that electrical industry would be nowhere near where it is today, after only 45 years of existence, if it were not for its early recognition of this sound economic principle, namely: that the customer who uses the company's service, and therefore its investment, the greatest number of hours per day per year is entitled to the lowest rate.

"In my judgment, the greatest increase in the sale of electricity, as compared with gas, in the last quarter of a century, has been due mainly to three factors:

"First—General recognition by electrical men of the fundamental economics which, as I have said, are identical in both industries.

"Second—The higher type of salesmanship applied in the electrical industry, and consequently keener effort to get new business.

"Third—Intensive research and experimenting, at great expense, for the development of electrical appliances.

One Great Obstacle

"Lack of adequate expenditure by gas appliance manufacturers for research and experimenting has been, in my judgment, a great obstacle to large-percentage increases in gas sales. I blame the gas manufacturers more than the appliance manufacturers for this in the past. How could one expect the development of apparatus for large-volume consumption when the basis of rate making was to charge each user the same unit price regardless of his use of the investment—a basis that was an absolute barrier to large-volume sales?

"Whatever success I have had in the gas industry has come by following the same economic principles that I have followed in the electrical industry. I intend to keep at it on the same basis. What has proved to be right in electricity must prove to be right in gas, for the economic principles are the same in both.

"The vitality and stability of the gas industry have been tested and proved by time. It has successfully weathered profound adversities—a revolutionary change in the decline of its lighting load; an economic cataclysm during the World War. Yet it is today stronger than ever. If it believes in itself, as I believe in it, then its best years are still to come."

Address of W. Alton Jones

The address delivered by W. Alton Jones, vice-president of the Cities Service Company, New York, "Executive Interest in and Responsibility for Sales" con-

tained ideas and suggestions that merit close attention on the part of the gas industry.

Mr. Jones spoke of the immense success of the automobile industry in its twenty-five years of business existence. He also indicated what radio has done in a space of five years. He attributed their amazing growth to intensified sales effort.

"In face of these records," said Mr. Jones, "should we feel satisfied with what we (the gas industry) have done?"

Continuing, the speaker mentioned three misconceptions that have somehow permeated the gas industry. First, to think that we have no competition because we are the only gas company in a given locality; second, the belief that our service is cheap, efficient and dependable and accordingly the public will use other costlier heating agents; third, the idea that only the well-to-do can afford complete gas service.

"There are thousands of Americans who are waiting for the gas companies to demonstrate to them the convenience and luxury of automatic house heating by gas. When they have a taste of this luxury they will be as slow to give it up as they are their automobiles," reassured Mr. Jones.

In concluding, the speaker voiced the opinion that the gas industry is beginning to sense that it has labored under false conceptions and is now undertaking a program of vigorous research, publicity and sales effort that will bring them the fullest results.

Paige Outlines Industrial Needs

"Whatever success may be attained in the adaptation of gas to industrial uses, research must always be the foundation of the structure," said Clifford E. Paige in his address, "The Executive and the Industrial Load."

He emphasized that the industrial department must continually assert its claim for recognition by demonstrating its accomplishments to the management.

"What does management want of the industrial department?" asked Mr. Paige. "It wants the department to retain existing business and to procure additional load. It recognizes that the growth and strength of the company depends on its load, and that earnings depend on the load. It undertakes to furnish the industrial department with a rate schedule by which, in its belief, business can be secured and held, and it requires that the industrial department service shall be of such high order that no loss of business can be assigned to lack of individual attention on the part of industrial department representatives."

Continuing, he stated that if the management is to be of real assistance to the industrial department it must assure itself that the latter is properly organized, that its duties are comprehended and that its individuals are given the opportunity to progress.

Referring to the effect of rates on the volume of business he advised as follows: "Can you point out many specific instances where you have lost business entirely because of rate, or where you have failed to get new business on this account? If so, unless your rate is out of all proportion to others, you must face the humiliating alternative that the other advantages of gas fuel have not been adequately presented. There are too many cases in this country where tremendous volumes of gas business have not been secured with by no means the lowest rate schedules in the country operating. Take some encouragement from this thought."

In summarizing, he brought out the following points:

1. Industrial gas development is unmistakably making progress.

2. Research must develop still more efficient equipment, both as an economic necessity and as a factor in progress.

3. There is a great need for more and still more highly-trained industrial salesmen.

4. Industrial gas rates must be well designed, but the future of industrial gas by no means depends entirely on the rate.

5. The executive who has contributed generously to the industrial section must do so to even greater extent.

6. Competent engineers must be employed by the Association to co-ordinate the efforts of the industrial gas salesmen and the production engineers in other industries.

"The New American Tempo"

An inspirational address, "The New American Tempo," by Robert R. Updegraff, associate editor of the Magazine of Business, was well received by an attentive audience.

"Something is happening in the gas business," said Mr. Updegraff, "that may be of considerable importance to America. That something is the permeation of a progressive spirit. . . . You are fighting your battles in advance instead of letting them come upon you.

"Gas is your field. From today on the job of the gas industry should be to go back to the elemental chemical fact that 'nothing is burned until it is turned into gas,' and live with that fact every day of the year, to see to it that no other industry finds a new or better way of applying it to the problems of heating, cooling and cooking."

Mr. Updegraff referred to the "wizardry" of electricity and suggested that some similar term or expression be applied to the gas industry. In this connection he suggested a slogan, "the magic of modern chemistry." He went on to explain how such an expression could be used to build up in the mind of the public both popular interest and an expectation of gas progress. "For example," he said, "suppose that you were to get the public expecting that the day was not far distant when they could get a thermostat in any room in the house at 68 or 70, and, through the magic of gas, the temperature would stay at 68 or 70—Winter and Summer—you would get busy and find out how to heat and cool houses by gas at economical rates to meet the expectation. And I believe you would succeed."

He further emphasized that the public expects much of electricity and little of gas and that in order to make such a condition more favorable to gas the public must be made to expect more of it.

"A great science is at your service," concluded the speaker—"the science of modern chemistry. A great force is at your command—the moulding force of the

printed word. Bend both to your needs and you will be able to get the American people to expecting great things of the gas industry and you will be able to meet the public's expectations."

AWARD OF MEDALS

The McCarter Medal, awarded for the saving of a life by the prone pressure method of resuscitation, was presented personally by T. N. McCarter, president of the Public Service Electric and Gas Company, Newark, N. J., and donor of the medal, to the following:

John Hamilton, William G. Webster, John G. Cummings, Frederick Davies and Percy Hedburg, all of The Peoples Gas Light and Coke Co., Chicago, Ill.; Ernest McGinn, Western United Gas and Electric Co., Aurora, Ill.; H. M. Keller and W. D. Sayle, of the Northern Indiana Public Service Company, Hammond, Ind., and Peter McLeon, Connecticut Light and Power Company, New London, Conn.

Mr. McCarter also presented the medal to Mrs. Susan McCoy, of Brooklyn, N. Y. She is the only woman ever to receive this medal.

The recipients occupied chairs on the stage and as each stepped forward to receive his reward from Mr. McCarter he was greeted with warm applause from the large audience.

The Beal Medal was awarded to Frederick W. Sperr, Jr., research director of the Koppers Company, Pittsburgh, Pa., for the most noteworthy gas technical paper presented during the year.

Mr. Sperr's contribution was on the "Dehydration of Manufactured Gas," and was considered one of the outstanding contributions of the past decade by the committee awarding the medal.

Due to the absence of T. R. Beal, president of the Central Hudson Gas and Electric Corp., of Poughkeepsie, N. Y., and member of the family donating the award, presentation was made by Mr. Beckjord.

Mr. Sperr is the only man in the gas industry to be awarded the medal twice, having previously received it in 1921. Among the few winners of the coveted medal in past years are Henry L. Doherty, head of the Henry L. Doherty Company, and Charles J. Ramsburg, of The Koppers Company, Pittsburgh, Pa.

Lang's Heroic Deed

For showing meritorious and conspicuous judgment, intelligence and bravery in saving the life of a fellow employee at the hazard of his own life, Henry C. Lang, of the Northern Union Gas Co., New York, N. Y., was awarded the American Gas Association Meritorious Service Medal by President A. B. Macbeth.

The presentation of the medal, the highest mark of recognition for bravery that the gas industry can give, was a dramatic feature of the convention and brought the audience to its feet in visible showing of its appreciation.

The following is a brief resume of Lang's act:

On Sunday afternoon, February 14, 1926, emergency man Henry C. Lang, of the Northern Union Gas Company rescued his companion worker, Louis Cefariello, when the latter was overcome by gas while repairing a leaking pipe in a deep pit outside of the armory of the 258th Field Artillery at Jerome Avenue and Kingsbridge Road.

Upon arriving at the armory the men were told the leak was at a ¾ inch pipe in a pit which could only be reached by going down four flights of stairs to a third sub-basement from where it was necessary to climb a nine-foot ladder to reach a small opening into the bottom of the pit. Upon arriving at this opening they found it blocked up with snow and had to dig a passageway through it. Upon doing so they were met by a strong flow of gas and went back for the gas mask which they carried on their emergency car.

Henry C. Lang

Cefariello put on the gas mask and climbed down the ladder into the bottom of the pit which was dark by that time, 4:30 P. M., on account of its depth and the fact that it was raining. Lang remained on the ladder for the purpose of guarding the end of the 25-foot hose coming from the gas mask while Cefariello entered the pit and started to climb another ladder to reach the broken pipe which was about ten feet above the bottom of the pit and about ten feet away from the entrance. This caused the end of the hose to come almost up to the opening of the pit where Lang was standing and some gas was passing through this opening and no doubt reaching the man with the mask and also affecting Lang.

Just a few moments after Cefariello had entered the pit Lang began to feel the effects of the gas and shouted to his partner that he would have to go and get some fresh air, but as Cefariello did not answer he entered the pit to see why and found him on the ground overcome. Although Lang felt himself becoming weaker and weaker, he dragged the stricken man until his head

was at the opening to the pit and while this was only a distance of ten feet a check up of the time shows it probably took him ten minutes on account of his weakened condition.

He then called for help through the pit entrance and after several calls Sergeant Starb, employed in the armory, came and assisted him to get Cefariello out of the pit and down the ladder away from the gas. Then Lang instructed Sergeant Starb and Assistant Engineer Winterhaler to apply artificial respiration while he went back to the emergency car four flights above for the inhalator.

Lang was so weak by that time that he crawled part of the way on his hands and knees but neverthless managed to get back to Cefariello and applied the inhalator to him for twenty minutes and succeeded in reviving him. After this Lang collapsed and had to be revived by another emergency crew which had been called out.

It was later discovered that the leak, instead of being from a ¾-inch pipe, was coming from a 4-inch pipe, the end of which had been broken off probably by the action of frost.

The A. G. A. Meritorious Medal is donated by Walter R. Addicks, senior vice-president of the Consolidated Gas Company of New York.

A. G. A. Meritorious Service Medal

Julianne Doane
Chairman

"Though we know that there are certain recognized important factors in public relations work, such as newspaper advertising and publicity, direct-by-mail advertising, customer ownership, so-called house organs and other miscellaneous publications, and the 'spoken word,' all our efforts along these lines would be wasted if we neglected to educate our own employees in handling the public."—Julie Pailet.

A. Deane Dowell
Home Service Counsellor

IF there existed any doubt in one's mind as to the growing importance of the woman's work and influence in matters pertaining to the gas industry such would have been dispelled by his attendance at the Women's Meeting of the Chicago convention of the A. G. A. Miss Julianne Doane, Dean of Women, The Peoples Gas Light and Coke Company, Chicago, presided at this important and spirited gathering.

Her remarks dwelt, in part, upon the fact that every one in business should overcome all sex consciousness and measure all employees in terms of ability which incidentally is in no wise concerned with the matter of sex.

Miss Doane indicated that there is a large field for women in the utility companies and particularly in the work the Home Service departments are carrying on. Further, they are well qualified to fill executive posts in the merchandising end of the business.

In outlining the duties of a dean of women Chairman Doane told of the woman's status with her own company. Before the war the Chicago company had less than 200 women employed whereas at the end this figure rose to upwards of a thousand. Most of them were in positions never before filled by women, but since a great many made good they were retained. Today the Peoples Gas Light and Coke Company has over 700 women on their payroll, twelve of these holding executive positions. The company has found it advisable to bar employment to married women. As the girls are married they are asked to leave the company's employ.

Concerning the relative salaries of men and women in similar positions Miss Doane is quoted: "I feel that if a job pays, if it is worth a single thing, a woman holding that position satisfactorily should get what a man should get."

Luce's Paper on Education

In his address, "Education of Company Employees," Mr. E. B. Luce spoke of the estimated annual loss of $25,000,000 to industry in the United States due to lack of training.

Outlining a scheme for employee education he suggests twelve "platform planks," substantially as follows:

First: There should be a close connection between training an employee for a certain job and the job itself. This training should be done by company men; however, superintendents are not the proper ones to carry it out.

Second: Existing educational facilities should be fully employed and the company should not indulge in educational work that is readily available on the outside. If such outside agencies are not meeting the needs the company should suggest and encourage their strengthening.

Third: The company should only provide such educational work as can not be readily gotten on the outside.

Fourth: Where the educational plan overlaps the company and the outside agency or school should work together.

Fifth: All education and training should follow the plan that the duties of the job come first and should be so served. "Employees are first workers and second learners; they are employed to work," said Mr. Luce.

Sixth: Such training that keys in with the job to be performed may be given on company's time; other education should vary from part-company part-employee time to all-employee time.

Seventh: Any educational scheme should be planned and laid out as carefully as other work of the company. The educational organization should be under some centralized control.

Eighth: Individual effort should be stimulated by giving prizes.

Ninth: Present training facilities should be used to the utmost before others are inaugurated.

Tenth: For the sake of economy the group method should be used, supplemented by some individual work.

Eleventh: Apprenticeship training should be provided.

Twelfth: Expense should be kept down and any separate educational organization within the company should be kept as small and compact as possible.

Mr. Luce referred to the basic fact that "whatever the capacity or activities, every department of the company is a producer of experience and knowledge, which are valuable assets. If this experience and knowledge were not passed on from individuals to individuals there could be no such thing as perpetuation of the company.

"Any plan of education in industry should supply the educational needs of the industry and its workers rather than the needs of schools and students. Education is a means to an end and in industry an end is useful work and service, the means being the employees," Mr. Luce aptly put in.

He went on to state that the educational program for gas companies may well include such items as summer employment of college and other students, taking graduates into apprenticeship or cadetship, employment of professors and instructors who need fresh contacts during vacation time to work in research and testing, permitting employees to take daytime courses under satisfactory arrangements to the company, granting special leaves or furloughs in certain cases and utilizing night courses.

Mr. Luce advised that his own company, the Consolidated Gas, Electric Light and Power Company of Baltimore bases its educational plan upon the "twelve planks" indicated and further, that such a plan has been accepted by the officers of this company and has been in successful operation for several years.

"The Versatile Utility Woman"

Miss Julie Pailet, New Orleans Public Service, Inc., spoke on "The Versatile Utility Woman." In her address she brought out that the maintenance of pleasant public relations is becoming an exact science. She showed how her company is building for better relations between the customer and the utility by educating the children in the public schools; taking them through the various plants and offices and explaining the operations of each department. Over 5,000 students, Miss Pailet said, have taken advantage of such visits of inspection and instruction.

"Though we know that there are certain recognized important factors in public relations work, such as newspaper advertising and publicity, direct-by-mail advertising, customer ownership, so-called house organs and other miscellaneous publications, and the 'spoken word,' all our efforts along these lines would be wasted if we neglected to educate our own employees in handling the public," said Miss Pailet. She emphasized the necessity for courtesy, friendliness, cheerfulness and loyalty on the part of every employee as means to obtaining good public relations.

In her address, "Consumer Confidence," Miss Marie Sellars, Postum Company, New York, narrated her experiences as a child in gas matters wherein the family did most of the repairing and adjustments

needed on gas appliances. She further spoke of her recollection of a gas company as consisting merely of "some fascinating big red tanks down near the railroad station and a man who came sometimes if there was a leak." After a consolidation of the gas company new appliances were displayed in an attractive manner, "agreeable and smart-looking girls bustled around behind the office cages and everything spelled courtesy, accuracy and promptness."

These attributes—courtesy, accuracy, promptness—Miss Sellars stated, "seem to be the most important in the building of consumer confidence."

Six Best "Sellers"

The "Six best 'Sellers'" from this interesting address are given herewith:

"I believe that there is no finer repair and emergency service being given today anywhere than by the public service utility companies.

"Accuracy will forestall more arguments and possible unpleasantness with the consumer than any other one thing.

"The greatest of all consumer confidence builders is courtesy.

"The girls who handle telephone adjustments have it in their power to do more to build up good-will for the company than any other members of the office force.

"When you think that thousands of women have no other means of expressing themselves except in their cooking, you soon realize the psychology of the (Home Service) pull that holds them in such rapt attention.

"Some people are naturally accurate, some can acquire accuracy and a certain type of fuzzy-minded people should never be put in a position where exactness is important."

Miss Grace Jo Mason, Federal Light and Traction Company, Tucson, in her address, "Home Service," stated that in operating the Home Service department of the gas properties of her company there have been installed model kitchens and such routine work as the holding of regular cooking lessons, special programs for holidays, cooking contests, etc., are handled.

"We must never lose sight of the fact," said Miss Mason, "that we are not only employed by a group of people organized into what is known as a gas company, but that we are working for the betterment of the foundation of our nation's backbone, namely, our home."

Due to the absence of Miss Mason her paper was read by Mrs. Arra Mixter.

The final paper of this meeting, "Better Correspondence," by Katharine A. Booth, The Peoples Gas Light and Coke Company, Chicago, disclosed some features and ideas that are of no small value.

Department Centralized

She told how her own company had centralized its stenographic department and had reduced its expense of operation to a minimum. "We have separate divisions for stenographic work, report typing, typing and bill writing, ediphone letter dictation, proof reading and mimeograph and multigraph duplicating, each of which has its personnel directed by a supervisor and all report to the superintendent or her assistant," said Miss Booth.

In the matter of mechanical and similar equipment she stated that they had standardized on certain appliances and had ignored the whims of certain individuals, thereby effecting certain savings and greatly facilitating the work as well as bettering its quality. However the employees are encouraged to make suggestions as to new equipment.

Miss Booth stressed the value of neat and well-written letters in assisting the furtherance of good public relations.

HOME SERVICE

THE one big idea to be derived from the three days meetings of the Home Service Committee is that there is a going phase of the gas industry's activities and one that it is difficult to fancy how we have gotten along without in the past.

Lecture demonstrations were given by Mrs. Arra Mixter and Miss Daurice Darling, the former handling the dinner menu and the latter the supper menu. Mrs. Anna J. Peterson was the hostess for each of the three days.

The school talk, "Do You Know the Value of Home Service?", given by Miss Grace Preston, Home Service Department, Eriez Stove and Manufacturing Company, outlined the great number of comforts to be derived from a home completely gas equipped. It also brought out how the homemaker should be instructed in the proper and economical use of the various gas appliances.

A quite unique lecture demonstration was given by Miss Frances Lauder, Home Service Director, Battle Creek Gas Company, in which she showed that a meal could be prepared in the gas range oven while the hostess entertained her guests. This talk brought out the value of the gas oven regulator.

Natural gas home service matters were well taken care of by Mrs. Flora B. Frey, East Ohio Gas Company, Cleveland, who spoke on "The Particular Problems of Natural Gas."

One of the features of the Home Service sessions was a playlet which illustrated the various emergencies and duties the Home Service director has to handle every day. These included lectures before science classes and other organizations, home demonstration calls, calls on women's clubs, classes in home management and demonstration at the company offices, broadcasting and advice by 'phone and mail.

Those taking part in the playlet were Ada Bessie Swann, Mrs. Luella M. Fisher and Mrs. Marjorie Pidgeon Wardman.

An idea as to what can be accomplished for the good of the gas company and the public was furnished in Miss May A. Bennett's talk, "Growing Up With the Gas Idea." This was in substance the talk which Miss Bennett has been giving to twenty-five thousand school children in Cleveland during the last school term.

"Home Service in the Gas Industry," was the title of an address delivered by P. D. Warren of the Peoples Gas Light & Coke Company. In his talk he outlined the history of Home Service from its inception and stressed the importance of its niche in the industry.

A. L. Tossell, Chairman

"It is time for us to recognize that high bill inquiries are not because of the activity of that inoffensive metal box around which we have allowed to exist an atmosphere of mystery, but the result of a lack of understanding on the part of the customer."—Report of Sub-Committee on Customers' Good Will.

H. W. Hartman, Secretary

THE nominating committee reported the unanimous nominations of Edward Porter of The United Gas Improvement Company, Philadelphia, Pa., as chairman, and F. H. Patterson, of the Rochester Gas and Electric Corporation, as vice-chairman of the Accounting Section of the association for the ensuing year.

Messrs. Porter and Patterson were then elected by unanimous ballot.

The exhibit committee reported that twelve new office appliance manufacturers were now exhibiting, seven of which were new exhibitors. The advisory

committee on A. G. A. statistics reported that the principal duty for which it was formed—to organize and develop a bureau of statistics at association headquarters for the general benefit of the industry—had practically reached culmination. Under the temporary leadership of George E. McKana, statistician of The Peoples Gas Light and Coke Company, Chicago, the bureau was organized and is already functioning.

Statistician's Duties

The appointment of Paul Ryan, formerly engaged in statistical work for the American Telephone and Telegraph Company of New York, as statistician in active charge of the bureau at association headquarters, was announced. He will report to the managing director and the advisory committee will act as guide and adviser and pass upon all data obtained and studies made before they are submitted for final approval.

Mr. Ryan is a graduate of the Massachusetts Institute of Technology and of the Harvard School of Business Administration. Since his graduation he has been on the staff of the Harvard Business School engaged in research in public utility economics and has done consulting work on rates and market analyses for gas and other utilities.

The committee also reported that the annual questionnaire, sent to all member companies, was completely revised and now follows the uniformity of the classification of accounts. This will secure the reliability of the information requested and the dependability of the comparisons made besides better meeting the growing demands for items of general information regarding the industry. H. W. Hartman, of association headquarters, assisted by Mr. McKana, effected the revision.

The questionnaire distributed to manufactured gas companies by the United States Census Bureau was also revised. Some of the information obtained through this medium was formerly subject to misinterpretation because questions were not sufficiently specific. H. C. Davidson, with the approval of the committee, established relations with the Census Bureau so that a sub-committee of Messrs. Davidson, McKana and Hartman succeeded in revamping the government questionnaire to correlate with the annual questionnaire and the uniform classification of accounts.

Further cooperation between the association and the Census Bureau is planned by continuing this contact.

Committee on Budgetary Control

The Committee on Budgetary Control reported that a formal budget is better than an informal one because it acts as an administrative device usable as a means for encouraging members of the organization to study past results, contemplate the future, plan and function. The budget develops individual employees by placing responsibilities upon them.

The committee warned against considering the budget as a panacea for all ills. "It should be considered in the nature of an administrative device," the report said, "and is no better than the organization responsible for the preparation and the carrying out of its provisions. The budget is not a substitute for efficient management, sound policies or good organization. It is, however, a device which can be used to promote all of these." The full report included sub-reports on the Operating Budget, the Construction Budget, the Cash Budget and the Budget of a Utilities Holding Company.

In the discussion that followed presentation of the report the increasing tendency toward departmental budgets was cited. Budgets were defined, not as a means of curtailment, but as instruments for direction. They were also defined as more satisfactory substitutes for "post-mortems." A "budget-consciousness" was recommended as a means of furthering company economy.

Sub-Committee on Customers' Good Will

The Sub-Committee on Customers' Good Will (part of the Committee on Relations with Customers) recommended that customers be urged to present all grievances to the company directly and immediately because, as the report states, "the mental state of dissatisfied customers is not of the moment. It has developed from past experiences." Customers are prone to repress small dissatisfactions until the cumulative effect of them results in a sudden feeling of ill will over a circumstance which in itself may be petty, according to the report. The fact that customers are apt to speak to other customers about their grievances if the trouble is not corrected by the company was cited as another reason for correcting the most minor difficulties as they occur.

The report contained the following, relating to high bill complaints:

"In the past we have looked upon high bills as the chief cause of 'complaints,' as we have miscalled service inquiries, and we have devoted our efforts to trying to convince the customer that the meter registers correctly when, as a matter of fact, the meter has little more connection with the size of the bill than the clock on the mantel has with that tired feeling in the morning because of late hours the night before. It is time for us to recognize that high bill inquiries are not because of the activity of that inoffensive metal box around which we have allowed to exist an atmosphere of mystery, but the result of a lack of understanding on the part of the customer.

"No one ever heard of a coal dealer receiving high bill inquiries. A householder buys a load of coal. He may think the price is high, but he sees a small mountain of coal for his money. As he feeds it to the furnace he realizes its value and the comfort his family gets out of it. But a gas customer usually sees nothing for his money except the bill for service. He does not think of the meals cooked, extra company, possible sickness, improved bathing facilities, and the warmth and comfort obtained from the space heater on cold days—all are forgotten by the time he receives the charge for this service. He understands quarts, tons, pounds and yardsticks, but he has never seen a cubic foot of gas. Consequently he often has no appreciation of the service it performs.

"If the chief cause of high bill inquiries is lack of

knowledge as to who controls the size of the bills, then it would follow that the employee as well as the customer should be educated to realize that the utility brings to the customer's premises a modern servant—Gas; but to what extent it may be utilized lies entirely in the hands of the customer. His desires alone regulate the amount of gas service he receives, whether it is cooking meals or heating rooms. The meter registration simply reflects the demands made on the service. The company does not attempt to control the amount of gas used, even though the service may be used wastefully."

On the matter of slow meters the report pointed to the fact that a satisfied customer is more important than the collection of an estimated bill.

Report of Insurance Committee

The Insurance Committee reported that the revised schedule for determining the fire insurance rate for gas manufacturing plants, published by the committee several years ago, is now being applied generally throughout the industry. It was recommended that installation of sprinklers be considered for both old buildings and new structures where there is some concentration of value and where the premium on a single building and its contents is $1,000 or more, as a saving in premium of from 50 to 85 per cent is often possible

The Committee on Cost Accounting Practices for Repairing and Recording Meters presented a very comprehensive report divided into a description of the physical routine practiced by one of the shops of the most varied functions and a description of the application of cost finding to this branch of activities. Unfortunately, the report is of such nature that it cannot be briefed. It is available in pamphlet form, however, and contains a large amount of pertinent information.

The Committee on Customers' Accounting and Development of Bookkeeping Machines reported the development of a small, portable and inexpensive machine for writing bills and proof sheet at one operation, for posting ledger at another operation, and for handling consumers' accounts of companies with around 1,000 meters or small branch offices of large companies. This machine will cost between $150 and $250, and the committee believes it will very likely fill a long-felt need by the small companies.

Several new machines to cover a number of processes are being perfected and the committee recommended careful consideration of them when they appear on the market in the near future.

The Committee on Statistics and Cost Analysis presented a report which contained, among other valuable information, a great number of charts and tabulations which should be of great interest to all gas utility accounts. It is recommended that those interested obtain a copy of this report at their earliest opportunity.

Sub-Committee on Meter Reading Practices and Remuneration

The Sub-Committee on Meter Reading Practices and Remuneration reported that, of the companies questioned, 54 per cent favored the married man, 23 per cent the single man, and 23 per cent held that it makes no difference whether the meter reader is married or single. From 20 to 30 years was thought to be the ideal age span and that the readers should be of average height. A high school education was recommended so that the men could be promoted to the commercial department.

The sub-committee advised the use of a manual of meter reading with a preface outlining the policy of the company and urging the meter reader to sow the seed of good will and avoid argument and misunderstanding.

District supervision of meter readers in companies having large forces was recommended and the sub-committee believed that the companies interviewed were overlooking this fact. "This seems strange," the report said, "in view of the fact that the clerical forces are usually very carefully supervised, notwithstanding they have less opportunity for wasting the company's time.

"In any kind of work or business it has always been deemed necessary to have supervision, and it would seem to be a decided advantage for the chief meter reader or supervisor to be on the district, keeping in touch with his men during the regular meter reading hours. There is no doubt that it has a certain psychological effect and is generally conducive of better results."

The sub-committee reported that opinion was divided as to whether meter readers should be uniformed or not, but from the data compiled it was indicated that uniforms would be considered favorably were it not for the cost of providing them, due to labor turnover. It was generally agreed that the company should pay all costs of uniforms.

Although the sub-committee could report no model wage plan or bonus system because of the varying conditions in different territories, some form of piecework or bonus plan was recommended as the best means of increasing efficiency and lowering meter-reading costs.

Supplying Gas Without Signed Applications

The Sub-Committee on Supplying Gas Without Signed Applications (part of the Committee on Relations with Customers) reported that from discussions held in committee meetings based upon replies to questionnaires sent out, it was convinced that definite recommendations were not advisable. Due to differences in customers served and territory covered, varying credit policies, impressions given the public through methods of electric companies operating in the same field and a number of other considerations, the facts upon which the sub-committee worked were not decisive.

Of seventeen companies consulted, nine reported they would continue to require customers' signatures; two stated that they would abolish them; two reported that they had abolished them; one said it would abolish them for domestic customers only, and three did not answer. The sub-committee mentioned the significance in the fact that fifteen of the seventeen companies replying based their stand entirely on opinions and not on experience. Furthermore, the

two companies operating without signatures had no intention of returning to former methods and their replies regarding the effect on customers' attitude, final bill collections, credit routines and cost of service were contrary to the replies of other companies.

Inasmuch as the majority of the companies are using applications and do not favor changing, the sub-committee recommended, although not unanimously, that applications continue to be used.

There was extensive discussion following the report and wide interest shown in the question. Proponents of both sides of the matter were firm in their declarations and their reasons for being for or against the change varied greatly. Many favored the application method for the same reasons others opposed it. A few objected to the signature procedure because it required the customer to make a trip to the company offices, and some adherents to the signature requirement favored it because it brought the customer to the offices and established a valuable contact. One delegate objected to abolishing the signature requirement because it increased telephone applications which were regarded undesirable, and another stated that telephone orders are highly desirable because they are a convenience to the customer. All agreed, however, that a signature should not be used as a legal tool for demanding payments or threatening action. It was also agreed that service should not be delayed under any circumstances.

A few of the many reasons given for eliminating the signed application were: The electric companies are doing it. No gas company which has abolished it has gone back to it. The signature means nothing in collecting a bill—credit references are more pertinent. Signed applications are an unnecessary burden upon the customer. The faith shown in supplying gas without a signature draws reciprocal faith in the customer for the gas company. Routine can be abolished. No increase has been recorded in accounts written off in the companies which no longer require a signed application. No signatures are required for credit on appliances.

Some of the arguments cited by those favoring retention of the signed application were: Errors in billing and spelling of names can be avoided with a signed application. Requiring the customer to visit the offices brings him before merchandise displays. Abolition of the signed application leads to telephone orders which are conducive to inaccuracy. A personal and friendly first contact may be formed through the application procedure. Failure to require an application suggests incompetent business methods. In some instances the signed application gives the company the right to enter the premises where gas is used.

"THE ACCOUNTANT AND HIS BIG JOB IN THE GAS INDUSTRY"

By Samuel Insull, Jr.
President Midland Utilities Company, Chicago

IN CONSIDERING the accountant's place in our industry let us attempt to analyze for a moment the conduct of the business generally. Our systems serve our consumers—the public. The property composing those systems belongs to our stockholders —its owners. The conduct of the property is delegated by these owners to a management. The management, moreover, in the very interests of the owners, must consider again the responsibility to those served. Before considering the accountant himself, therefore, we have three factors—the people served, the owners, the management.

The management's function, of course, is to conduct the business. It can only act in this conduct, however, on the basis of information on the past and present happenings of the business. The accountant's function, simply defined, therefore, is to furnish the mangement with a statement of what happens. This may seem simple enough, but it carries with it an ultimate share in the responsibility of the management to the public who is served, and to the stockholders who own our systems.

A Statement of What Has Happened

The accountant's function in any business, moreover, is to produce a statement of what has happened. The production of such a statement, reduced to a single figure, may be either a very simple or a very complicated operation. In the early stages of most industries, and in a few industries throughout their growth, it is not a very hard piece of work. In our own industry, however, the reverse is true.

Money is continually being spent by a gas company for a diversity of purposes. It is being spent by many different departments. In an increasing number of cases, moreover, it is being spent over a very wide area.

To determine the results of the operation of a gas company, therefore, the accountant is called upon to perform the following distinct operations:

First: He must assemble an exact statement of out-go; in labor, in material and in money. The assembling of this statement certainly involves a departmental, and often a geographical, consolidation of figures.

Secondly: He must analyze this statement of outgo to determine for what purpose the money was spent.

Thirdly: He must join the results so obtained to the figures, easier of computation, indicating the income.

Facts Must Be Properly Stated

No decision by the stockholders as owners of the property, or by the management on their behalf, can be correct unless it is made in the light of a proper statement of the facts. The property of the owners, therefore, is in continual jeopardy of mismanagement if the accountant has not furnished a true statement of what has happened as a result of previous operation.

The responsibility thus devolving upon the accountant is clearly realized, both by him and by other branches of the business. Collateral obligations, however, are sometimes not fully realized by the accountant himself, and are too often disregarded by other departments.

The very diversity of the sources of information,

and the complexity of their analysis, demands that the accountant should be in possession of the clearest evidence of original transactions of labor, material and money, from which to build up his statement of what happened.

Too often there is a tendency to confuse charging with method of accounting. Diverse methods of charging expenditures can well exist, but in a given property there can be but one true accounting. It is well within the province of the management to take a hand in the method of charging expenditures. In the method of accounting for expenditures, however, the operating management can not, and certainly should not, concern itself.

An Illustration

Perhaps an illustration at this point may serve. Let us assume that a gas pipe line is being laid along a city street. Suppose, moreover, that the line, when completed, will serve partly to transmit gas from a generating station to a group of customers in an outlying district newly attached to the company's mains, and partly to supply existing customers along the street, previously served from an old and worn out pipe line which is, in the course of new construction, dismantled.

It is well within the province of the operating executives to join with the accountant in determining what proportion of the expenditure for the new main is chargeable to investment, and what proportion to the renewal or maintenance of existing facilities. The operating executives can do this, because they best know what it would have been necessary to spend on the old main were it not replaced; what the original cost of laying the old main was, and in what degree the new main constitutes an addition to the company's ability to serve customers.

On the other hand, in the actual gathering and separation of the cost of the new main from the cost of other work in the neighborhood, done by the same street department coincidentally, the operating executives and their organization can do little. To produce the statement of cost by this separation is simple when one has a knowledge of the actual material and labor used, and the actual time spent by supervisory and engineering forces. The accounting department alone is in the possession at the same time of information on labor, material and time. The accounting department alone has records from the street superintendent, from the storekeeper, from the engineering and executive departments, and from the office payroll to give these facts.

Not the Last Word

If the operating departments do attempt to arrive at the contribution to the cost of the main made by any one or two of these factors, it can not add to such contributions, those of the other factors affecting the expenditure. No operating department has conclusive knowledge of financial charges, of the cost of executive supervision, or of many other factors which must be added to the bare labor and material costs. In many cases, moreover, and this is said with the greatest respect to the operating departments, they can not check fully the material that gas gone into a piece of work.

The final calculation, therefore, must be made by the accountant. If he permits the operating department to furnish him anything but original data, he is making a statement based in part of hearsay, and not upon evidence. If the operator conversely attempts to give the accounting department anything but original information, he is engaged in activity which rightfully should be elsewhere duplicated, and, in other words, is taking on unnecessary work.

It is even possible to extend this analysis of the accountant's position in his company to the position of the accountants as a body in the industry and in this association. The different situations will involve different requirements, but the principle will remain the same; namely, that the accountant's responsibility for his figures demands that he dig deeply into the sources of those figures and into the methods of assembling them.

The industry regarded both as a diversity of units, and as a whole, represented by this association, can not progress unless its knowledge of itself is correct.

Statistical and accounting information on the industry is a crying need, but that information, when produced, will be worse than useless if it is not correct in the final detail.

Information on our industry is valuable chiefly in this association to determine trends over long periods, or for purposes of comparison with other competitive industries. If your accountants will dig deeply you will, on the one hand, secure conclusive information on our industry, and on the other hand, establish methods which will perpetuate the conclusiveness of the facts that will come to light in the future.

We have talked a great deal about the competitive aspect of the gas business. It is not necessary to here dwell upon the fact to establish it. We can take it for granted. So far the emphasis has been particularly upon the necessity of selling gas in a competitive field, and of producing it and distributing it at a cost that will permit competitive sale.

All Roads Lead to the Accountant

The accountant, however, has his part in this competition. Competitive markets mean close markets. It is manifestly impossible for a management to operate on a close margin unless it is in possession of exact figures. The accountant, therefore, is again at the very root of the matter. Before action is taken by the management, or even a decision considered, figures must be presented. The production of those figures is in the hands of the accountants of the industry, and theirs is a sacred responsibility to bring into this association accounting figures, and to establish throughout the body of the industry accounting methods that will give our producers and our salesmen a clear statement of what they are doing, and what they can do.

Only with such a statement can they be expected to battle intelligently in the competitive fuel field. There thus devolves upon the accountant the responsibility for hewing truly the cornerstone of fact upon

which our salesmen and our operators can build a structure of management that will bring our industry out victoriously in its competition with other fuels.

This responsibility of the accountant, moreover, is not peculiar to our industry nor to our time. In the early days of the accounting profession, and in the case of some institutions whose organization dates back to those early days, the charge is even more definitely recognized than today.

A Case in Point

In the case of the Bank of France, for instance, there are two separate auditors who render no final statement of the operations of the bank, except at the annual meeting of the shareholders. These auditors are appointed by and report to the shareholders solely. They are empowered to demand from the officials of the bank whatsoever information of an original character they may need. Certainly if this, and similar instances, form the historical background of the auditor's calling, he is justified in demanding from our foremen and our storekeepers, as he has from our treasurers, the original statements of labor and material and office payrolls.

Nor is such a demand supported by the mere historic dogma of his calling. The accountant is the eye of the operation. He can not transmit to the management a statement of the company's business unless his vision of the myriad transactions going to make up that business is direct and unimpeded by an intervening screen. Even through a glass one may see darkly. Between the copy and the original, as much as between the summary and the original, can error creep in.

As the accountant's obligation to state the exact happening involves a personal responsibility for the soundness of his figures, he can not, in justice to himself, make the statement and assume the responsibility if he has built it up on hearsay and not on original evidence.

Responsibility Not Justified

The roots of the accountant's responsibility lie deeply enough in history. The responsibility is not justified, however, on mere dogma, historic or otherwise.

Let us consider again the three functions: ownership, management and accounting. With the justifiable addition of the public interest, the management is called upon, in a progressively run business, to act upon specific questions of operation, which added together establish a trend to the benefit or detriment of both the stockholders who own the property and the public which is served by it.

If the management is not furnished with a true statement of what happened it must needs fail in its task. In such a case then there will lie at the door of the accountant the responsibility for corporate action detrimental to the stockholders who own the property, or the public who are served, and too often to both. Should the accountant, with such a responsibility, question that he must base his statements only upon the most direct and original evidence of transactions?

To put a practice into effect, however, more than justification of a principle is required. Corporate organization must be respected. Other departments of the business must be allowed to function from day to day, and if he is human, the accountant will be anxious to avoid undue friction with his colleagues.

Accountant Will Save Work

Fortunately, the accountant has at hand a cogent argument to use with his colleagues in other departments; he will save them work. Although it is well to know we are just in our aims, it is equally salutary to consider the distaste which the public entertains for the reformer, though he advocates sound measures.

If the accountant, in instituting his routines, and already armed with the knowledge that they will simplify the work of operating departments, will shape his arguments and his installations so as to emphasize that simplification, necessary changes will be effected more harmoniously and more speedily. The accountant is in the fortunate position of being able, in fulfilling his own responsibility, to be of greater service to his colleagues.

The human reaction of this service, correctly presented and instituted, will be to facilitate the fulfillment of the accountant's responsibility. The accountant will be able to secure, easily and quickly, the original evidence upon which alone he can base his statement of happenings. He will be able to present to the management correct data and will have done his part to insure decisions beneficial to the shareholders who own the property, and to the public who are served by it.

OFFICERS AND DIRECTORS ELECTED FOR ASSOCIATION YEAR — 1927 - 28

President—Oscar H. Fogg, Consolidated Gas Company of New York, New York.

Vice-President—Bernard J. Mullaney, The Peoples Gas Light and Coke Company, Chicago, Ill.

Treasurer—Clifford E. Paige, The Brooklyn Union Gas Company, Brooklyn, N. Y.

Directors (two-year term)—H. C. Abell, Charles M. Cohn, J. S. De Hart, Jr., F. C. Freeman, R. W. Gallagher, Arthur Hewitt, T. N. McCarter, Francis H. Payne, H. S. Schutt.

Section Officers

Accounting Section: Chairman, Edward Porter; vice-chairman, F. H. Patterson.

Commercial Section: Chairman, J. J. Burns; vice-chairman, G. M. Karshner.

Industrial Gas Section: Chairman, F. C. Mackey; vice-chairman, J. P. Leinroth.

Publicity and Advertising Section: Chairman, E. Frank Gardiner; vice-chairman, James M. Bennett.

Manufacturers Section: Chairman, H. Leigh Whitelaw; vice-chairman, John A. Fry.

Technical Section: Chairman, Walter C. Beckjord; vice-chairman, H. E. Bates.

COMMERCIAL SESSIONS

J. J. Burns, Chairman

"Trying to squeeze an extra dollar or two out of the business at the expense of the salesman is extremely poor economy."—Stanley Jenks.

"From an abstract view of purely institutional gas advertising, I can think of nothing in which the public is naturally less interested."—J. R. Pershall.

J. W. West, Jr., Secretary

CERTAINLY from the standpoint of the scope of the papers and addresses as well as the high quality of the same the sessions of the Commercial Section were an unqualified success. The commercial activities of any gas company constitute an important phase of its work and, in conjunction with the industrial department, are almost entirely responsible for increasing the gas load.

The problems of a gas company Commercial Department are both large in number and variety and any part of a convention purporting to include many of these knotty questions must indeed furnish an ambitious program.

It is felt that the program of the Commercial Section as presented at the Chicago convention was not only ambitious and comprehensive in scope but also furnished workable ideas for those who had the gumption to attend the meetings and a modicum of perception to grasp the thoughts and ideas dealt with.

Chairman Burns briefly called attention to the scope of the Section's work and its importance to the industry. He spoke of the necessity for gas being nationally advertised and contended that there is no reason why gas, which is nationally used, should not be nationally advertised.

The nominating committee, of which R. J. Canniff was chairman, recommended that the present officers be continued in office; such recommendation being adopted without dissent.

Fine Paper by Searle

The first paper of the session, "Are We Anywhere Near Saturation?" by R. M. Searle, was splendidly conceived and delivered. It is believed that it constitutes a high-water mark for convention papers of a commercial nature.

Mr. Searle showed by means of a large chart how the sendout in Rochester has been predicted from year to year. He then narrated how this enabled them to plan for expenditures on new plant and distribution equipment.

By means of the curve chart he pointed out the present sendout in his city of 13,000 M per day and the expected figure by 1940—about 53,000 M.

He indicated that house heating is no "bug bear" for the gas company in Rochester and related how they have gotten the architects there to specify gas house heating.

His company has instituted departments wherein they will go out and insulate old homes and double-glaze the same in order to get the prospect interested in gas heating. The charges for this insulating and glazing will be put on a monthly payment basis.

Mr. Searle touched upon the matter of getting the large industrial customer to build his own holder, thereby tending to flatten out the peaks, cutting down gas plant investment and having the customer himself assume part of the financial hazard.

He suggested the advisability of having the gas house heating customer invest his money in the gas company to take care of the installation cost and then get gas at holder cost, plus 10 cents, plus a few other items. On this basis the cost per M in Rochester would be something under 50 cents. The volume increase with a lowering rate attending same tends to put you further from saturation.

Mr. Searle was of the idea that inventive genius along the line of producing methanol and other products will help straighten out the peak.

Concerning Domestic Cooking

"What's Ahead in Domestic Cooking?" by Geo. Whitwell, furnished some excellent ideas as well as illuminating discussion. From Mr. Whitwell's paper and the ensuing discussion might be mentioned the following:

The matter of holding and increasing the domestic cooking load against divers competition does constitute a problem and, as a matter of fact, in some cases there has been a real loss in the cooking load. Some of the reasons for this state of affairs are competition by electricity, with its small, portable units, and changed living conditions.

The increasing number of hotels, restaurants and the like show that people are more and more eating away from home.

The women want leisure from the duties of the kitchen which influences the eating-away-from-home movement. Moreover, bakeries are turning out more bread which condition tends to lessen the cooking load.

It was suggested that ranges, like autos, be changed at intervals thereby giving the housewife something new to see and think about.

Just as the electric industry has emphasized the word "modern" so must the gas industry make use of this expression since it is an accepted fact that the average woman wants that which is "modern." This "modern" aspect must be aided by national publicity, broadcasting and similar publicity media.

Exhaust fans operated by motor will help keep the kitchen cool in the hot months and thereby encourage more cooking with the attendant increase in the load.

There must be full and prompt response to complaints so that the range and other cooking apparatus will not fall into disrepute.

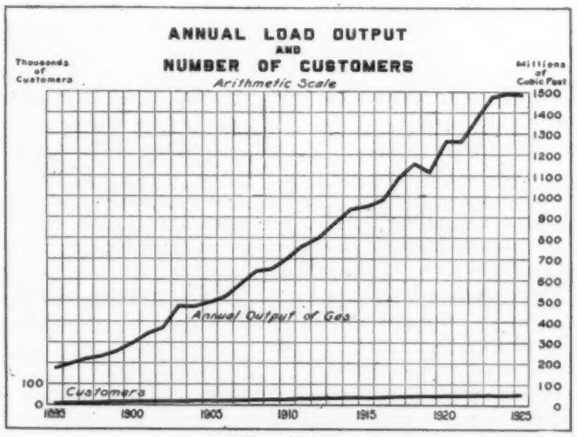
Effective Home Service work, cooperation with dealers and other like efforts will aid in holding and increasing the cooking load.

B. A. Duvall, of Baltimore, offered a resolution to the effect that company members should sell only approved appliances. The subsequent motion was carried.

Commercial Statistics

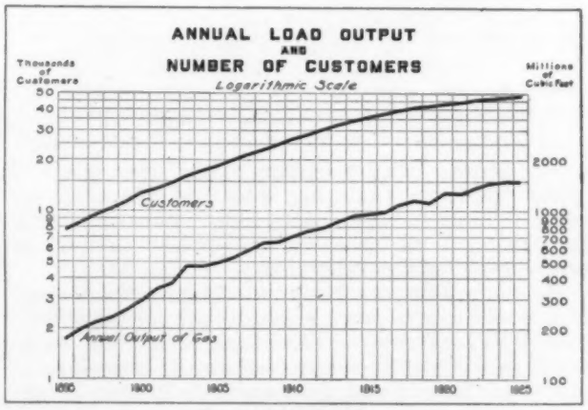
The growing importance of and need for regularly studying commercial data was clearly demonstrated in "The Importance and Use of Commercial Statistics," read by T. H. Brown of the Harvard School of Business Administration.

He read to the effect that in considering a particular item's market it is advisable to determine its potential demand, that is, the total number of units which can be put into the consumers' hands.



Arithmetical Graph

With this idea in mind Mr. Brown discussed the method for determining the demand for gas house heating installations. He held that the gas house heater is to be considered in the luxury or semi-luxury class, depending on the cost relation of gas to oil and coal. Also, the population unit to which it will be sold will probably be the family living in a detached house. At all events, the following factors must be considered in determining the demand:



Logarithmic Graph

Number of incomes in each of the various classes of incomes.

Number of houses classed according to assessed valuation.

Number of homes owned, classed according to assessed valuation.

Number of autos classed according to price.

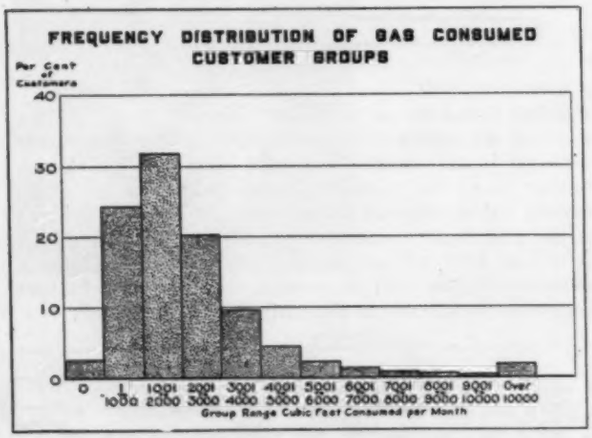
Number of electrical appliances in each home.

Considering each of these factors, Mr. Brown was of the opinion that it is difficult to obtain incomes by classes in a city and hence this is passed by. It is likewise probable that the question of house ownership for the majority of localities is not so important as the assessed valuation. The number of electrical

appliances is also of minor significance so that the best guides are factors four and five, enumerated above.

Apply this reasoning to an example, assume that the rate per M in a particular locality brings the cost of gas heating to a point 50 per cent higher than for coal. Next, if you estimate that any one in this community with a home assessed at $12,000 could stand this extra heating expense then, it would seem, the number of houses assessed at more than $12,000 would give a line on the number of potential customers. In an almost exactly similar manner the number of autos valued at, say $2,000, should produce a like estimate. An estimate of this character would have to be revamped in order to take care of obsolete and secondhand cars.

No way has been proposed for the determination of rates statistically to the end that the largest profitable potential market may be developed.



Typical Commercial Graph

Mr. Brown called attention to the importance of using graphs in analyzing sales and the need for every executive and commercial manager being familiar with the ordinary line graphs as well as semi-logarithmic or ratio charts.

He reminded that a study of frequency distribution charts will give a fairly accurate line on the justification for a Home Service department. In other words, a study of the charts before and after installing Home Service will show any gain in the particular class of customers that this department will most largely appeal to.

In concluding he advises against allowing figures to grow dusty in the files, whereas if analyzed and plotted graphically they will reveal many worthwhile things that should tend to augment the load.

Large Volume Water Heating

There are few better qualified to speak on the subject of "Large Volume Water Heating" than H. J. Long. In turn, there is no topic in the commercial routine that is worthy of more careful study and consideration.

This paper emphasized that there is a vast undeveloped field for large volume water heating and further, that the idea is not something new. Isolated cases exist in every community where large volume water heating is being done successfully. The development of automatic storage water heaters and efficient means of utilizing the steam heating boiler in Winter with indirect heaters have widened the market so that the use of gas for this purpose is practically limitless.

The thermostatic mixing valve is an extremely valuable accessory to industrial water heating and for shower baths in clubs, Y. M. C. A.'s and the like it "effects a saving of one-third to two-thirds in waste of water which means about two feet of gas for every gallon saved," said Mr. Long.

The gas man can make capital of the waste and inefficiency which the cheapness of coal has brought about. However, the installation of gas water heating equipment must be wisely and adequately planned as to water piping so as to give the best results.

Touching upon apartment houses and hotels, he was of the opinion that the business, at the start, can best be gotten by way of installing a combination storage system, using gas for Summer, as a booster, during Spring and Fall, and an indirect heater on the steam heating system for Winter. "All year business for this class of prospects will eventually come."

From data at hand Mr. Long stated that it has been shown that Summer water heating can be done in apartments at a cost of from $2.00 to $2.25 per family with gas at $1.10 per M. Taking a typical installation of twelve families where a separate coal heater is used requiring one ton of hard coal a month at $15 per ton, there is shown a yearly cost of $180 for water heating. Estimating the six months of summer at $2.25 per family per month for gas and four months with auxiliary gas at $12 per month there would be a yearly cost of $210 for hot water with gas, as compared with $180 for coal.

The figures for one city where gas is used extensively for apartment house Summer heating were given:

Number of families	Cost per apartment per month
6	$2.10
6	2.83
6	2.69
9	2.25
10	2.48
11	2.35
12	2.30
15	1.89
18	2.88
25	1.86

The cost of the appliance and its installation constitute one obstacle to sales; however, the offering of a free trial sometimes affords the easiest way to overcome this handicap.

The Laundry and Refrigeration

Some interesting figures that should prove very useful were given by A. M. Evans of the Federal Electric Company. His paper, "Sales Possibilities in the Domestic Laundry," showed that out of 15,923,060 homes which are prospects for gas-heated ironers only 280,000 or 1.7 per cent have been sold; of the same number of prospects for gas-heated washers, only 4,250,000 or 26.7 per cent have been sold. While figures on gas-heated clothes dryers are not included in the survey, Mr. Evans felt that approximately the same figures would apply to the dryer as apply to the ironer.

From the standpoint of load factor, his paper showed that the two-burner gas heated laundry stove consumes 40 feet per hour; the gas-heated washer 40 feet per hour; the gas-heated dryer 80 feet per hour, and the gas-heated ironer 40 feet per hour. With this equipment in operation there would obtain a total connected load of 200 feet per hour. Assume this load is used four hours per week; then you would have a consumption of 41,000 feet per year for each home so equipped. If a certain community has 5,000 homes there would be added 208,000 M per year which, figured at $1.00 per M, would amount to $208,000.

Mr. Evans was of the opinion that in order to get such business there should be carried out carefully laid plans, with properly trained salesmen, adequately compensated. Moreover, the prospects should be educated by way of advertising, demonstrations and the like. The appliance also should be properly serviced.

H. D. Valentine, Central Hudson Gas and Electric Corporation, spoke briefly on the subject of "1927 Developments in Gas Refrigeration," terming 1926 the "period of invention" in gas refrigeration, 1927 the "period of stabilization."

In 1926 there were 17 gas refrigerating units sold as against 5,200 in 1927.

He told how one air conditioning company has designed an air furnace for heating in Winter and, with an ejector system, for cooling in Summer, the same being gas fired.

"What Do Rates Mean to a Commercial Department?" was well handled by T. F. Kennedy of Henry L. Doherty & Company.

He spoke optimistically of the outlook and emphasized that competition must be met by way of scientifically adjusted rates. He said that the time is not so far distant when the average domestic meter will show a consumption of 300 M annually.

House Heating

House heating by gas while in a healthy condition still has some problems to be solved which will require careful study and follow-up. This was shown in the paper "House Heating Developments During the Past Year," by H. Leigh Whitelaw, vice-president of the American Gas Products Corporation.

His paper disclosed that a comparison of a two years questionnaire sent out by the house heating committee shows a 9 per cent increase in the number of house heating customers served by identical companies reporting in 1926 and 1927.

The reports received by the Association indicate that 156 gas companies have made heating installations in 1927 as against 71 in 1926. In turn more than 50 additional gas companies have stated that they are beginning to actively push gas house heating. Further investigation shows that only one-tenth of one per cent of the customers of gas companies reporting in 1926 and 1927 have house heating installations coming under the head of central heating plants.

With all of these house heating installations taken on the basis of the companies reporting in 1926 and 1927 it is revealed that but 1.6 per cent of their customers are using central fired systems.

Notwithstanding these gratifying reports, Mr. Whitelaw said "the fact remains that we are up against a stubborn selling job." Statistical studies disclose that the establishment of low rates for gas house heating will not of itself bring on a glut of business.

The heating of large buildings has made progress and the fact that many gas companies are heating their own buildings with gas has given an added impetus to the proposition. In many cases there are large buildings with from 10,000 to 50,000 square feet of radiation that are heated by gas.

One interesting fact shown by Mr. Whitelaw was that between 5 and 10 per cent of the house heating installations are replacements of original oil burning jobs.

At all events, emphasized the reader, house heating by gas, if it is to attain any considerable proportion, will not be asked for by prospects; it must be sold, regardless of the rate per thousand.

"I would like to see," said Mr. Whitelaw, "the A. G. A. compile from the actual experience of its members, a standard plan or sales manual for the promotion of central fired house heating, which most nearly met the requirements of the industry."

Salesmen's Compensation

The matter of properly compensating salesmen and its ultimate effect on increasing the load received due attention from E. R. Acker, Central Hudson Gas and Electric Corp.; Stanley Jenks, Public Service Company of Northern Indiana; P. B. Wiske, Brooklyn Union Gas Co., and John G. Learned, Public Service Co. of Nothern Illinois. Their remarks and observations on the subject, "The Influence of Salesmen's Compensation on Load Building," are herewith outlined.

Acker: His company maintains a Kardex file for every customer, which shows the appliances installed in each home and other pertinent information to assist the salesman. The original record was made by an actual canvass by the entire sales force and serves as a means for properly routing the salesmen —each has from 1,000 to 1,200 customers in his district. This file brings out the record of every time-payment customer sixty days before completion of the last regular payment so that the salesman may sign him up for another appliance.

Effective selling requires a sales force that will properly represent the company, give continuity of service and produce sales volume of load building appliances. To this end Mr. Acker's company has outlined a plan of salesmen's compensation that aims to meet these requirements. This plan is based on the assumption that each salesman will produce not less than $1,000 gross merchandise sales per month. It is as follows:

1. A salary of $100 per month.

2. A merchandise commission of 4 per cent on the cash selling price of gas and electric appliances except electric refrigerators for which a 3 per cent commission obtains.

3. A load building commission of 20 cents per M cubic feet of yearly estimated consumption of the appliances sold. (The A. G. A. yearly rating on appliance consumption is used.)

4. A bonus each twelve months of 5 per cent additional merchandise commission on all business in excess of $12,000 gross for the twelve months period, and 50 per cent additional on all load building commissions earned in excess of $350 for the twelve months period.

The territory is divided into three divisions, each with its separate sales force and supervisor. In order to eliminate the salesmen selling less than $1,000 worth of merchandise per month a continuous competition is run between the three divisions. This competition is based each month on the sales of the low men in each division. The division having the highest of the three low men for the month wins a point. At the end of the year the division having won the most points wins a cash price of $50 for each salesman in that division.

Under the plan in effect since August, 1926, twelve of their salesmen out of thirty have earned in excess of $2,600 per year, the high man earning $3,600, and the turnover of the sales force has decreased materially. The average salesman during the first eight months of 1926 sold $600 worth of merchandise per month. During the first eight months of 1927 the average salesman sold $1,500 per month. The type of salesmen has markedly improved and they have a waiting list. The overall cost of selling has been only slightly increased over that experienced under the straight commission plan, while during the first eight months of 1927 the load building value of the appliances sold was 37 per cent more than those sold during the first eight months in 1926.

Jenks: The gas industry must organize itself to do an intensive selling job if it is to grow. The salesman is the biggest factor in improving the load. "Trying to squeeze an extra dollar or two out of the business at expense of the salesman is extremely poor economy." The dollar is the magnet that has attracted them from a steady income at desk and bench and for it they are betting on themselves against the world by waging the gas company's fight with a public that is being hard pressed by other businesses. So long as the salesman can earn the proper income it does not matter what plan of compensation is adopted. The better portion of the salesman's income should come as commissioner, since this stimulates him continually to keep at it.

Wiske: A gas company's problem of selling is different when compared to other selling enterprises since it includes store, door to door canvass, and district campaign, in addition to wholesale selling. This diversity is probably a reason why the matter of proper compensation is a problem.

Straight salary compensation lacks flexibility, for if the salesman slows down it is discouraging to the more conscientious but lower paid fellow. Moreover, straight salary does not offer enough to a beginner to attract good salesmen.

Mr. Wiske's company has adopted a salary-commission plan, the same being patterned after the scheme of one of New York's best known department stores. Each sales person in the store receives a weekly salary, the amount depending on length of service and satisfactory performance of his work. In addition, he receives a commission on the net sales made by him. This latter is paid monthly.

In order to develop the load there may also be offered additional commissions on those appliances that give the greater consumption.

Learned: In the absence of Mr. Learned his contribution was delivered by Mr. Miller.

The gas company cannot afford to weaken its standing with the public by hiring salesmen who are not capable of performing properly.

The Public Service Company of Northern Illinois pays a salary plus commission for the following reasons:

1. To place a premium on constructive and scientific development of the business.
2. To educate present and prospective customers to new uses for gas.
3. To encourage the securing of higher load factor business.
4. To obtain new business on existing gas mains.
5. To establish more friendly relations with customers.
6. To encourage all employees to take an active part in stimulating a greater use of the company's service.
7. To promote continuity of service of employees in the sales organization.

Commissions and bonuses are based on the value of the business to the company and regular salesmen and clerks are paid the same over and above their regular salaries. The company's commission schedule provides for the payment of commission to the salesman for securing applications in premises not previously connected to the company's mains, provided the salesman has personally called on the customer. Ten per cent is paid on the retail price of gas appliances for domestic and commercial use, excepting gas-fired boilers and domestic ranges. There is paid 5 per cent on the retail price of domestic ranges exclusive of installation cost.

Special salesmen are used for boiler and furnace sales and they are paid a commission of 5 per cent on the retail price. Where a heating contractor makes a sale previously developed by the salesman the latter gets 3 per cent commission.

This Snap Acting Thermostat will Improve Your Storage Water Heater

Fifty tons of Thermostatic metal will be used this year in the manufacture of this famous disc.

KLIXON IMMERSION TYPE THERMOSTAT

Snap acting—absolutely accurate—lasts indefinitely. Rugged—rough handling won't harm it. Made in one piece. No toggles, cams, levers or diaphragms. Nothing to service or give trouble. The Spencer Disc does it all—in .00016 of a second.

Unique construction coupled with forceful snap action makes valve self-grinding and gives unlimited life without variation in settings.

SPENCER THERMOSTAT CO.

Kendall Square Building, Cambridge, Mass.

The Million Dollar Thermostat

"No-Blo"

At Economy's "No-Blo" Exhibit
at the A. G. A. Convention

The Inlet Pipe Was Filled with Pipe Scale & Iron Borings

The valve seat remained clean—there was no pressure build—there was positive lock-up.

Thousands saw it.

Send for an Economy Service Governor—with "No-Blo" Unit.

Economy Governor Company

Anderson, Indiana

Eastern Representative:

Mulcare Engineering Company *100 Park Place, New York City*

BEST GAS PURIFIER

Lux Material

It is an acknowledged fact that the Fe_2O_3 content in a precipitated oxide is about 50% higher in Lux than in any other.

The inerts in Lux are just in the correct proportion.

You can safely use 20% less of Lux than of any other substitute and have still better results.

Don't be misled by a lower price. It's results that count and the results with Lux are guaranteed. Lux is always uniform. Practical tests have shown that Lux is about 50% more efficient than any of the substitutes but the price is less in proportion.

Write for Information

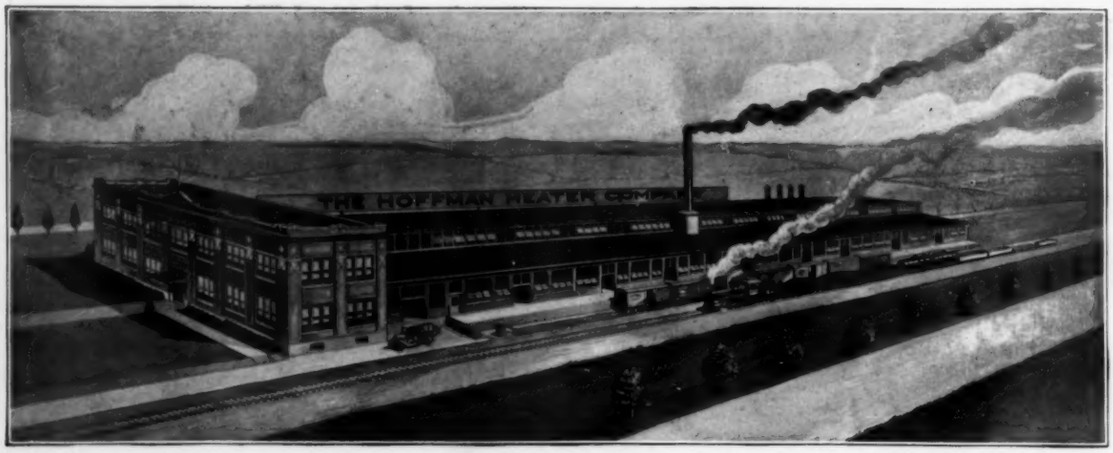
THE ALPHA-LUX CO., Inc.

192 FRONT ST., NEW YORK CITY

Shipping Points Convenient to All Parts of the Country

Lux Sponge

THE PERFECT READY MIXED OXIDE

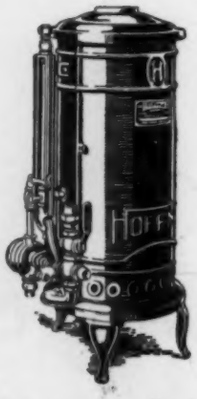


In Leadership Lies Safety

The mushroom growth of the water heater industry, with its influx of fly-by-night manufacturers, makes it more than ever important that the heaters you sell should be made by a leading, well-established company.

Back of Hoffman Heaters are the world's finest and most up-to-date plant of its kind, 25 years of leadership in the building of dependable hot water heaters, and assets of more than a million dollars. Thus to sell Hoffman Heaters is to be relieved of all worry concerning the stability of the maker.

Recent improvements in Hoffman Heaters have made them more efficient and more saleable than ever before. Magazine and newspaper advertising is making them even better known. Can you afford to bother with slow-moving heaters that may become "orphans" when Hoffman Heaters are so easy to sell and are backed by such ample resources in money, experience and equipment?



No. 3, one of the seven sizes of Hoffman Instantaneous (direct type) Automatic Gas Water Heaters.

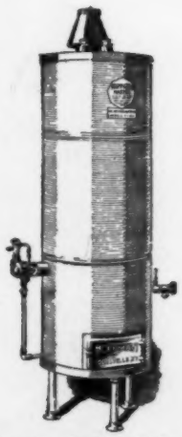
Famous for Long Life

Recent advertisements in this publication have illustrated Hoffman Heaters 18 and 20 years old. It pays to sell heaters that give years of service with little or no attention.

HOFFMAN
AUTOMATIC
GAS WATER HEATERS

THE HOFFMAN HEATER CO., Inc.
1701-15 Eighteenth Street, Louisville, Ky.

Hoffman is the ONLY concern manufacturing an absolutely complete line of water heaters, including instantaneous heaters in all sizes, domestic storage systems, multicoil storage systems, unit storage systems, tank heaters and house heaters.



The new Hoffman Master Automatic Storage System (patents applied for), which is available in two sizes.

The company pays sales clerks 2 per cent on the retail price of gas-fired appliances sold in the sales rooms. This does not include gas-fired boilers, gas-fired radiators or storage water heaters.

A "Go-Getter" Paper

"What You Go After You Get" was the apt title of a paper read by Mrs. Anna J. Peterson of the Peoples Gas Light and Coke Company, Chicago.

She emphasized that Home Service does not permit of halfway measures and further, that the director and her staff must be well informed on all subjects pertaining to the home and anatomy.

"Home Service," said Mrs. Peterson, "is not an experiment; it is not something we are trying, but a live institution and should function as one of the biggest parts of any gas company. It can only do this through the co-operation of every member of a gas company from the president, officials—yes, even the janitor."

She stated that there is a growing interest in the minds of homemakers today to lessen the time spent in the kitchen and that the chain grocers are aware of this condition and make capital of it.

She showed that from an analysis of 10 months magazine advertisements in the leading women's magazines, out of 356 ads in the September issues 53 were for foods (these ads covered everything used in the home). Of these 53, 40 required the use of gas from 5 minutes to 4 hours. As an example, to prepare a package of Jello one pound of water at 65 degrees Fahrenheit are required to be brought to a boil. If Home Service could get 800,000 of the Chicago customers to make this simple food it would substantially increase the consumption, as four-fifths of a cubic foot is used by each customer. The leading women's magazines report that 50 per cent of their correspondence is on the subject of food.

Demonstration in Home Service must be accurate, definite and to the point. Its accompanying talk must be educational and "a sort of subtle salesmanship." The needs of the home must be understood and service rendered accordingly. Such service must be given in a simple high class manner. The ideal appliance for selling gas is the up-to-date gas range with oven regulator.

"If we ourselves as Home Service and gas people haven't the foresight to make our job the biggest and most staple thing in the gas industry," said Mrs. Peterson, "we can never sell the homemaker the ease and comfort of cookery because we don't exemplify it ourselves."

The Testing Laboratory and the Blue Star Plan

Some of the telling points made by Alfred Hurlburt, vice-president of the Equitable Gas Company, Pittsburgh, in his paper, "The Commercial Value of the Testing Laboratory," and the attendant discussion follow:

The laboratory must be under way a few years before the full results can be obtained.

Its institution and subsequent successful functioning is the greatest single outstanding thing the American Gas Association has done.

The laboratory has been of great help to the natural gas industry and has materially assisted in bringing the various natural gas companies together in a common and helpful understanding.

Cheap, wasteful gas appliances will considerably nullify good gas service.

The laboratory will tend to bring the various steamfitters and plumbers and the gas companies together where gas-fired boilers are concerned.

One man, in discussing this paper, narrated how a house tenant was induced to connect a range that had stood in the house for some time. The tenant was merely told of what the A. G. A. was doing to safeguard her. She was originally afraid to use gas.

There is a growing interest in the Blue Star Plan which seems to offer a worthwhile solution to the proper and extensive use of gas in the home. R. J. Canniff, Standard Gas Equipment Corporation, and A. E. Higgins, American Gas Association, ably demonstrated this in their paper, "The Blue Star Plan Today." The high lights and discussion were as follows:

The Blue Star should stand as a symbol to give a conception of what the minimum requirements should be for a particular appliance. It should be, in a sense, a trade mark. It should popularize gas and increase its use in the home.

Other competing industries such as radio, automobile and the like, with high grade selling, are taking our due portion of the customer's dollar.

The Blue Star is the pledge of the entire industry and the public must be made fully aware of the plan before it can be a success.

The various food companies spent $16,000,000 last year to popularize their products. Against this figure only about $4,000,000 is chargeable to gas.

Home building is keeping up this year but the builder must be sold the idea of the complete gas home. Along this line many gas men are not sold on the merits of their own product.

When the home is being built it will need, at the outside, from $1,500 to $2,000 worth of gas equipment, but the builder must be shown that he can get much more for the house by the gas man. If this equipment is not gotten into the home at the time of building the gas company is shut out for five or ten years.

Proper and Effective Advertising

J. R. Pershall, of the Public Service Company of Northern Illinois, in his paper, "Advertising From the Merchandising Viewpoint," voiced the opinion that gas companies will derive better results from advertising when they tell the people what they want to know instead of matters which the gas companies think they should know.

"From an abstract view of purely institutional gas

advertising, I can think of nothing in which the public is naturally less interested," said Mr. Pershall. "There seems to me to be no use trying to make ourselves believe that we are getting anywhere when we run advertisements in the newspapers showing a picture of a 3,000,000 cubic foot holder and four paragraphs about how gas is made, or the amount of coal it takes per year to make it, or the number of times around the world our low pressure mains would extend.

"Institutional advertising has its place and its distinct value, but all these facts about our capacities must bore the public.

"A few weeks ago," he said, "a certain town in Illinois ran out of ice during an exceedingly hot spell. After three days of the heat the ice companies were sold out and there was no ice to be had—foods were beginning to spoil, baby's milk began to sour—the next day we ran a half-page advertisement in the local newspapers on electric refrigerators, followed that with a somewhat smaller advertisement, and that week we sold as many refrigerators in that town as we had all year up to that time."

In briefly discussing this paper B. J. Mullaney agreed that we must get away from talking about ourselves and he said that gas companies are sometimes too lazy to tell the customer what they should tell him.

Co-operative Merchandising

"Co-operative Merchandising" was the subject of a symposium by J. E. Davies, The Peoples Gas Light and Coke Company, Chicago; G. M. Karshner, Consolidated Gas Company of New York; H. D. Valentine, Central Hudson Gas and Electric Corporation, Poughkeepsie, and F. F. Capen, Boston Consolidated Gas Company.

Below are given the high lights of their remarks on the subject.

Davies: The gas man needs assistance from others to help him market gas but he must settle in his mind whether the merchant in his town selling gas appliances is his associate or competitor. If an associate, then it must be made possible for him to make a profit on his merchandise. This will, of course, aid in selling more gas.

The plumbers and heating contractors are business men who use their capital with the objective of making a profit on their merchandise and piping work. Accordingly they are interested in what the gas company can do for them by way of aiding them in making a profit.

The dealer knows that the gas incinerator can be marketed, also the combination gas-fired kitchen heaters and ranges, and he should be encouraged to sell them.

In Chicago there are 125 dealers taking orders for gas ranges on gas company contracts. The gas company supplies the samples and pays the merchants attractive commissions. Many department stores, furniture houses and hardware merchants sell gas ranges, which is a profitable business for them.

Ten years ago the Chicago company began to market gas for house heating and all of the business done up to three years ago was handled by the gas company. In 1926 the heating and ventilating engineers secured about 18 per cent of the total sales of boilers and furnaces and this year they will market approximately 49 per cent of all central heating plants sold in Chicago.

Eighty per cent of all gas water heating business this year will be done by jobbers and plumbers in Chicago. Five years ago the gas company did 50 per cent of business whereas today, with only 20 per cent of the total business done in this city, the gas company is doing three times more business than was done a few years back.

In the hotel and restaurant department the Chicago company maintains a corps of sales engineers who work with the architects, equipment houses, and the owners and operators of restaurants and hotels. Their job is to sell gas as a fuel for cooking and the co-operative plan has worked very well.

Karshner: This company now gives discounts to plumbers and dealers on all gas appliances. The company does no piping and makes no gas connections for appliances in new buildings. Neither does it make any water or steam connections for any appliance, leaving this work to the plumbing and steamfitting trade. On all house heating boilers and industrial steam boilers the company allows a percentage of the selling price to the plumber and fitter making the water and steam connections. The hotel and restaurant supply houses are sold appliances by the company at practically cost. This has largely done away with coal installations in new hotels and restaurants as all of the supply houses boost gas fuel.

The utility should co-operate with the dealer either by agreeing to service the appliances sold by him, assisting in dealer advertising, staying out of certain fields, carrying accounts, making gas connections on dealer-sold appliances or some other methods. Any such co-operation should be considered as expense to sell gas rather than merchandise expense.

If some agreement can be made so that the dealer can make a profit on a laboratory-approved appliance the sales organization of the gas company will have to push approved ranges sold by them as well as approved ranges sold by the dealer. This will call for some sort of salesman's compensation which will pay the salesman for the range he interests the customer in in case the customer eventually buys the range from the dealer. It is obviously difficult to maintain a sales organization that works up prospects and sees the actual sales made by someone else

"I believe the question is so important," said Mr Karshner, "that I would like to make the following suggestion: That a regular committee of the Commercial Section be formed to consider dealer cooperation and make a report at the 1928 convention, and further, that the Manufacturers Section be asked to form a committee who can meet with the Commercial Section committee for discussion of the subject. The manufacturers are vitally concerned in this problem and they know more about dealers than we

do. Under such procedure there should be progress in 1928."

Capen: The gas company sells appliances to sell gas and hence their interest does not stop with their installation. On the other hand, the plumber or department store is interested for the most part in the profit they make on the appliance and there is little or no free service after a limited amount of time. The plumber also looks for some repair work on the appliances he installs.

"In my opinion," said Mr. Capen, "to get several of the representative plumbers together, also department store managers, and frankly discuss the situation with an open mind is the best way to start any co-operative movement."

Plumbers and department stores have erroneous ideas as to gas company methods and the gas companies in turn have not understood the former. Mr. Capen's company, by way of conferences, has been able to interest the plumbers to the end that they sell gas appliances where they could have sold coal or oil.

Valentine: His company strongly recommends the getting together of plumbers, dealers and department stores with the gas company and their conferences in this connection have been productive of much mutual good.

"Selling Incineration," by W. R. Lacey, Home Incinerator Company, Milwaukee, brought to light some valuable points concerning the matter of incinerators. He spoke of the value of this appliance, its field and what should be done to accelerate sales to a point commensurate with its merits along the line of sanitation and fire prevention.

H. O. Loebell, Chairman

"What we need is a salesman with a salesman's turn of mind at the head of the gas business for a while."

"What we need is a Moses, possessing a salesman's genius, to lead us out of the wilderness."—Philip Cabot.

C. W. Berghorn, Secretary

THE Industrial Gas Section elected Mr. F. C. Mackey, Public Service Company of Northern Illinois, to the chairmanship of their section for the coming year. Mr. Mackey's term of office will begin October 28, 1927. Mr. J. P. Leinroth was elected to the office of vice-chairman.

The keynote of the Industrial Section's activities at the convention undoubtedly was the need for more and better merchants in the industrial gas business. This thought was sounded at the outset of the first meeting by Chairman H. O. Loebell in his most excellent report of the Industrial Section's activities during 1926 and 1927.

Chairman Loebell pointed out the necessity of better sales promotion through the proper use of advertising and publicity, contact with educational institutions and trade associations. "Subordinate to sales promotion are the engineering problems, incident to industrial department activities," said Mr. Loebell. "Nevertheless, engineering must be economically sound and above all, absolutely accurate." Mr. Loebell also pointed out that the industrial department's relationship with the management needed closer study and cooperation. An understanding between the industrial department and the management of every gas company should be more sympathetic.

Mr. Loebell's recommendations for the coming year include a plea that gas companies consider their industrial gas sales organizations in greater detail; that gas companies entertain greater interest in industrial gas surveys, and that gas companies analyze their cost of producing gas. All three of his recommendations strengthen the keynote of the entire industrial section's activities: Better Merchandising. Unless gas companies adjust their rates in due time to take on large industrial business they will find these same industrials installing their own gas plants. In closing, Chairman Lozell said that we had better change our slogan to read as follows: "If It's Done With Heat, You Can Do It Better With Central Station Gas."

Outstanding Paper by Philip Cabot

Professor Cabot of the Harvard Business School, Cambridge, Mass., prepared what is believed by many to be the most outstanding contribution to an Industrial Gas Section meeting. Although unable to attend the convention himself, his paper was read by Mr. Melott, a colleague, who made the presentation in a most excellent fashion. Professor Cabot's paper was fearless in style. He "hewed to the line, and let the chips fall where they might." Such statements as the following indicate Professor Cabot's diagnosis of the present situation. (It might be said here that the professor's paper was not an indictment but, on the other hand, a very clever diagnosis.)

The professor pointed out that the advent of the electric industry undoubtedly started an era of better salesmanship in the gas business, but there was still a great need for merchants.

Several economic facts were brought out in the professor's paper and it is interesting to note that many of the thoughts on the economics of merchandising are identical with those mentioned in Messrs. Chase and Schlinck's book, "Your Money's Worth," and Borsodi's "Distribution Age."

One idea expressed was that the size of a gas company in which greatest economies could be had from all departments was determined by the cost of distribution. Cabot said that it made no difference how cheap a gas company could manufacture gas if the cost of distribution due to geographic situations became prohibitive. This is food for thought, as Professor Cabot suggested that it might be economical for such a company as the Boston Consolidated Gas & Electric Company to resubdivide into many smaller companies each vying with the other for sales supremacy, etc.

Another basic and economic fact expressed by the professor is that the gas industry lacks merchants with merchants' ideas as executive heads. He pointed out that in many instances executives of gas companies are engineers and that the production man nearly always forgets the question of salesmanship.

He suggested that it might be well for the gas industry to have a few merchants at the head of their businesses. "What we need," he said, "is a salesman with a salesman's turn of mind at the head of the gas business for a while."

Professor Cabot, of course, denounced the backwardness of the American gas industry in making scientific rates. He said that the gas industry was burdened at the present time with past practices of bad rate making.

He closed his paper with a few remarks of very great importance. He said that in the home, the real competitor of gas was not coal, oil or electricity, but rather the radio, the automobile and the moving picture. "What we need," said Professor Cabot, "is a Moses, possessing a salesman's genius, to lead us out of the wilderness."

John G. Learned's Paper

The keynote of the entire Industrial Section meetings was continued in John G. Learned's excellent paper entitled, "What Can Be Done to Accelerate the Industrial Gas Load?" Mr. Learned, who is vice-president of the Public Service Company of Northern Illinois, is responsible for the annexation of a tremendous industrial gas load by his company, and it is felt that his comments on the subject are of great value. The principal thoughts expressed by Mr. Learned were as follows:

Salesmanship in all its phases is growing in its importance in the management of all industries.

Salesmanship coupled with engineering knowledge is of vital importance to the gas industry and must be more highly developed.

The best brains and talent available must be employed by the gas industry to secure the maximum volume of industrial gas sales.

The salesmen must have implicit confidence that where heat in volume is required it can be done with gas fuel.

They must be thoroughly schooled as to the uses of gas in industry.

They must subordinate engineering to salesmanship.

Last, but not least, they must be properly compensated for their efforts.

Obviously, Mr. Learned concurred with Professor Cabot and Chairman Loebell in the thought that the industrial gas business needs more and better merchants. Mr. Learned adds to the general thought that there is a necessity for proper compensation for the efforts of these merchants.

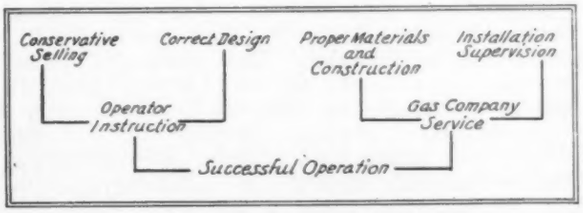
Mr. G. I. Vincent, vice-president Syracuse Lighting Company, Syracuse, New York, spoke on "The Value of Survey to Management." He pointed out that it enabled the manager to intelligently plan for the future both as to the distribution and manufacturing of equipment as to design of rates. "Incidentally," he said, "the survey means more intimate contact between the industrial gas salesman and the industrial gas customer and that the survey idea meant more frequent contact with the customer."

Mr. R. L. Manier, chairman Survey Committee, Syracuse Lighting Co., Syracuse, N. Y., reported on the work of his group and how they had divided

the United States into five districts, each with a sub-chairman. Mr. Manier's activities as chairman of the Survey Committee is very capably reported in his printed paper, which may be found in the Transactions of the American Gas Association.

"SERVICING INDUSTRIAL GAS APPLIANCES"

Mr. A. M. Apmann, Consolidated Gas Co. of New York, New York, N. Y., prepared a paper on "Servicing Industrial Gas Appliances." The idea is quite new in many localities and there are several of the larger gas companies who have not as yet entered this field of sales work. Mr. Apmann's paper is, without doubt, one of the leading contributions to the Industrial Section meetings this year. The American Gas Journal feels that a synopsis of the outstanding points of Mr. Apmann's excellent paper is of very great importance to the gas industry at this particular time. To begin with, Mr. Apmann diagrams service as follows:



Apmann's Diagram of Service

Two of the first four are functions of the manufacturer, the others, gas company duties. The next two are combined functions, but with greater responsibility on the gas company. The result is joy to the customer. Coordination of these is most essential. It requires keen analysis, careful judgment, sense of commercial values, and a simplicity of instruction, so that all the interested employees will be completely versed in the design, maintenance and operation of the appliance. "Eliminate constructional defects," says Mr. Apmann, "which will cause poor pressure complaints, leaky joints, define equipment in relation to the needs of the customers, prescribe installation methods and generally act as a liaison between the maker, the commercial departments, shops and the customer."

"You may wonder why I stressed selling heat service instead of fuel. A fair annual sendout per meter is 34,000 cubic feet. You can calculate that this is equivalent to three-quarters of a ton of coal on a strictly B.t.u. basis, or, at the worst, three tons per customer. Need I emphasize that on a competitive basis, heating service, including all the important essentials of keeping equipment at 100 per cent efficiency is necessary to overcome the cost differential against gas as a fuel only.

"Servicing pays; an analysis is given showing that for all classes of industrial work, including restaurant, boilers, house heating and industrial, the cost is less than 3.4 cents per $1 of revenue. Consider what the cost of selling gas and the appliances is, then balance that against three-fourths of a cent. I have no doubt that more care will be given to the service department and its work. An interesting comparison is given showing the revenue per meter and the average industrial rate. Sufficient data were used (200 companies) to offset recent changes in rate and the geographic location. It is seen that the return within the range of household rates is almost uniform, but when the rates drop so they are attractive to industry, the revenue drops. Had I the data on the expenditure for servicing of these companies I could prove what my experience knows to be true, that those companies spending money on service are reaping returns above the amounts given in the table.

Organization of a Department

"A few words on organization or re-organization of a department. This can be done in three ways from the top down, from the middle down, and from the bottom down. Power in an organization is different from that in a building.

"Authority proceeds from every organization chart, from stockholders through directors, officials, executive department heads, down to the minutest person, and not up from the foundation, as in a building. A service organization built from the top down will have the right attitude; personnel may need revision periodically. Building from the middle down depends on the higherups. If they have the correct feeling to this necessity it will be most successful; if not, it may. But it is most pathetic to engage a man who has made a record for servicing and put him in charge under an unsympathetic superior. It is disastrous to the company and disloyal to the man brought in. Building from the bottom down is like landing a 54?-pound sea bass on an 8-ounce line. The pictorial sections of the daily newspapers have it once in five years. That's for two reasons; first, a 54?-pound bass is rare in any case, and then the line is very frail, and the chances of advancing against a tight organization is also given space in the daily newspapers.

"Then comes loyalty in an organization. Respect, obedience and loyalty of an employee to his superior are expected. If not, he's liability on the payroll. How much more important then is loyalty of a superior to a subordinate. Loyalty there means not only upholding his actions and decisions, but also teaching him, training him for advancement. Training subordinates is the best training anyone can have. If you fear that his increase in knowledge will cause your throne to totter, dispel that fear. His increase in knowledge means a more perfectly functioning department; it means more time for you to decide new and important policies, leaving the details to him, and further, it will give you a powerful insight in your position and its possibilities that you will be restive and able to oust the man above when your subordinate is ready to relieve you. Try it. The secret of an executive's success is laid in three words: Educate, legislate and delegate. Do that with your service department then watch the success of your industrial department grow."

Mr. R. H. Staniford, the Brooklyn Union Gas Co., Brooklyn, N. Y., reported on the work of the "Competitive Fuels Committee" for the year.

Mr. J. P. Leinroth, the Public Service Electric & Gas Co., Newark, New Jersey, reported on the work of the "Education of Personnel Committee." Mr. Leinroth told of the outstanding achievements of his committee which is the successful presentation of three courses during as many years of industrial gas salesmanship in the offices of the Consolidated Gas Company of New York. Mr. Leinroth recommended that in the coming years that there be closer cooperation between various state organizations who either have or are planning to have operated short courses in Industrial Gas Engineering.

Report of Policy Committee

The report of the policy committee was read by the chairman-elect, Mr. F. C. Mackey. Mr. Mackey continued with the trend of thought of the Tuesday meeting by stating in different words and in a different manner that the policy committee felt the need of more and better merchandisers in the gas industry.

His committee specifically recommended better personnel for the industrial department, more intelligent use of the survey, greater patronage of the short courses and prompt adoption of proper rate schedules.

Mr. E. L. Wilder reported on the work of the rate committee of the industrial gas section. His report was very excellent and deserves a great deal of commendation on the part of industrial gas men everywhere. Mr. W. D. Chapman, of the Peoples Gas Light and Coke Company, suggested that the rate committee of the industrial gas section change its name so as to avoid any confusion with the rate committee appointed by the advisory board of the industrial gas section.

A paper was read by Mr. H. A. Clark, Detroit City Gas Co., Detroit, Mich., "Resume of Outstanding Industrial Gas Installations Made During Year." His talk was very excellently illustrated with stereoptican lantern slides. Mr. K. Emmerling, the East Ohio Gas Company, Cleveland, Ohio, reported on the activities of the "Sales Methods Committee," and Mr. H. H. Smith, of the Boston Consolidated Gas Company, Boston, Mass., reported on the activities of the "Speakers' Bureau." Mr. N. T. Sellman, of the Consolidated Gas Co. of New York, N. Y., delivered a most excellent paper entitled, "Contact With Furnace Manufacturers."

JOHN F. WEEDON'S REPORT

One of the most pertinent reports of the industrial gas section was that of the "Advertising Committee," presented by Mr. John F. Weedon, the Peoples Gas Light and Coke Company, Chicago, Illinois. Mr. Weedon reported that the policy of placing industrial gas copy in trade journals and other suitable publications pursued in 1926 had been continued in 1927 with comparatively little change. He reported that his committee had arranged the budget of an annual expenditure of $35,000, allocated as follows:

For Trade Journals	$26,334.65
College Publications	1,129.04
Nation's Business	2,400.00
American Restaurant	840.00
Leaving a balance for art work, type setting, proofs, booklets and merchandising incidentals	4,296.31
	$35,000.00

The committee made use of 20 trade journals, six technical college papers, and one publication of national circulation, as follows:

Chemical and Metallurgical Engineering, Electrical World, American Restaurant, Baker's Weekly, National Provisioner, Journal of American Ceramic Society, American Machinist, Forging, Stamping and Heat Treating, Foundry, Fuels and Furnace, Iron Trade Review, Iron Age, Transactions of American Society for Steel Treating, Editor and Publisher, Industrial Gas, Industrial Power, Manufacturer's Record, Ceramic Industry, Metal Industry, Inland Printer, Nation's Business, Illinois Technograph (University of Illinois), Technical Engineering News (Mass. Inst. of Technology), Tartan (Carnegie Institute of Technology), Michigan Technic (University of Michigan), News Letter (Johns Hopkins University), Ohio State Engineer (Ohio State University).

The class of copy the committee is using is designed to inform the industrial men of the country that gas is rapidly coming to the front as the only logical fuel for industrial uses.

It believes by the constantly increasing use of industrial gas in all sections of the country that our advertising is a very material assistance in creating this demand.

Breadth of Industrial Gas Advertising

It believes this all the more for the reason that member gas companies individually have done very little in the way of advertising industrial gas in their respective localities, through the medium of newspapers and publications.

The American Gas Association offers newspaper mats, for local use, of all the "ads" used in the trade journals, and furnishes them at cost, but during the past year comparatively little use has been made of this opportunity. This may be due to the fact that we seem to have run into a sort of Sabbatical year, and the budget strings have been drawn tight around the waist. In some cities the managements may consider that on account of the comparatively small number of potential industrial customers a daily newspaper is not the best means of appeal. Whatever the reasons may be it seems to be a fact that very little industrial gas advertis-

ing is being done, in current publications, outside of that which is done by the advertising committee, under its own jurisdiction.

In order to make the appropriation cover all the publications the committee wished to use it was necessary to curtail the number of appearances in some of them. Some the committee cut to six times a year, instead of twelve, and others to eight or nine. But it managed to get some representation in all the publications which the committee, as a whole, desired to use.

The committee is this year asking for a larger appropriation so that it will be possible to restore all publications to a full time basis, or as many of them as it desires to use in that way. It believes when that is done it will find that it has, for the present, all the trade journal coverage it needs, with the exception of some hotel and restaurant publications. This division of gas company activities having become an integral part of the industrial gas section, should be properly represented in its advertising plans.

As different industries are conducted in different parts of the country, your committee welcomes advice from any member company as to the nature of the industrial gas business they are getting, or desire to get, together with any suggestions as to publications which might be of service in helping them to get that business.

It is hoped that the appropriation asked for this year will be sufficiently large to enable the committee to venture further into publications of national circulation or a more general nature than trade journals.

The committee has reached the point now where it should make an appeal for what is known in advertising circles as "Customer Acceptance."

It has also under consideration the advisability of setting aside a certain sum of money to pay for some billboards on the more important railroad lines—so that he who rides may read—"If It's Done With Heat, You Can Do It Better With Gas."

Reiteration is the secret of conviction, and in opinion of the committee, we cannot repeat this slogan too often.

Report of Publicity Committee

Mr. H. O. Andrew, Robbins Publishing Company, New York, N. Y., chairman of the "Publicity Committee," made a most excellent report on the activities of his committee, greatest of which is undoubtedly the work of Mr. J. B. Nealey, who was engaged as a paid publicity man early in 1927.

Forty-seven original articles have been written of which 25 so far have been approved and distributed to 120 different business papers. Of these 32 have been published in 26 different business papers an additional 12 articles have been formally accepted. A further 11 articles have been republished from gas company house organs, etc., and 22 more have been accepted but not yet published. This gives a total of 77 articles that have appeared or will appear shortly—an average of three a week over a period of active work covered. These figures do not include any of the articles published in the trade papers in the gas field.

To show the variety of applications covered in the articles written up and published it will be of interest to list some of the magazines which have used these articles. These include Iron Age, Manufacturing Industries, Foundry, Iron Trade Review, American Restaurant, Radio Manufacturers Monthly, Club Management, Bakers Helper, Accessory and Garage Journal, Sheet Metal Workers, Radio Engineer, American Electric Railway Magazine, Spice Mill, Wholesale Grocer News, Cafeteria Management, Manufacturing Clothier, Ceramic Industry, The Canner, Fuels and Furnaces, Industrial Finishing, Clothing Trade Journal, National Lithographer, Factory, American Machinist, Canning Age, The Enamelist, Western Florist, Rayon, Forging, Stamping and Heat Treating, Brass World, Butchers and Packers Gazette, Metal Industry, Paint, Oil and Chemical Review and several others. A total of 45 different business mediums, excluding the gas papers, were reached.

Various Reports and Papers

On the concluding day of the convention the industrial section had the pleasure of hearing the report of the Hotel and Restaurant Sales Promotion Committee by Mr. Wm. De Freitas, Consolidated Gas Company of New York; Mr. N. T. Sellman, Consolidated Gas Company of New York, reported on "Industrial Gas Research Committee;" "Research Committee," by W. D. Thompson, The Laclede Gas Light Co., St. Louis, Mo.; "Progress Committee," by Mr. H. A. Clark, Detroit City Gas Company, Detroit, Mich., and "Contact With Technical Bodies Committee," by H. H. Clark, United Public Service Company, Chicago, Illinois.

The report of the "Display and Contact With National Industrial Organizations Committee" made by Mr. D. W. Chapman, The Peoples Gas Light and Coke Company, arrested the major attention of the concluding meeting of this section. Mr. Chapman gave the history of the committee in a few paragraphs, the substance of which is as follows: The American Gas Association was literally forced into exhibiting at the annual meting of the American Society for Steel Treaters on account of the activities of the competitors of gas fuel. Steel Treaters are large users of fuel. Such an exposition as was felt necessary is too expensive an affair for gas manufacturers to handle without assistance. Therefore during the past two years the association has bought and given to certain manufacturers under contract arrangement, space at the annual exposition. Manufacturers who exhibited at the Steel Show in Detroit are as follows: American Gas Furnace Co., C. M. Kemp Manufacturing Co., Surface Combustion Co., Welding Metals Co., Eclipse Fuel Engineering Co., E. Leitz, Inc., Stillwater Mfg. Co., Wilson Maeulen Co., and Sullivan Machinery Company.

Thirteen thousand square feet of floor space was used by Steel Treaters in the Detroit show. The

entire north Woodward Annex was reserved for the exhibit of gas furnaces. The total sales price of gas equipment displayed was $76,000. The total expense of the American Gas Association was $15,000. The attendance, 61,580, of which 55 per cent was that of members. Mr. Chapman's report points out conclusively that the show was well worth while to the American Gas Association. That the money expended will reap rich returns, that the committee did well and that it was a good show in every respect.

A very interesting paper was read by Mr. J. F. Quinn on the subject of "Gas Economics of Brass Melting."

Mr. W. D. Thompson, The Laclede Gas Light Co., St. Louis, Mo., also read a paper on the subject of "Enameling," which was profusely illustrated with lantern slides and a moving picture film.

The most spirited meeting of the Industrial Gas Section was the final one and was caused by a very interesting informal debate on the subject of "Gas-Fired Forging." Perhaps there was too much complacency in the first two meetings of the section, but all barriers were removed on Thursday afternoon when the leading industrial men of the country entered into spirited discussion of various methods of securing the forging load. Mr. W. M. Hepburn, Surface Combustion Company, Toledo, Ohio, gave an extemporaneous talk on the value of research which was a real inspiration to all who heard him. Mr. Hepburn's remarks prompted a discussion which lasted more than one hour and in which many valuable points regarding forging were forcibly brought out. Professor White, of the University of Michigan, made several valuable contributions to the arguments ensuing Mr. Hepburn's talk.

Mr. Hepburn's paper is printed in full at the end of this section of the convention report.

Inspection Trips

Incidental to the Industrial Section's meetings there were held three inspection trips to Chicago plants using industrial gas. The first was held Monday morning, October 10, 8.30 A. M., at which time 51 visiting delegates were taken via automobile to the Deering works of the International Harvester Company, where they inspected the following installations: Brass melting (non-crucible), forging (rod end), core baking (truck type), hardening (continuous), tempering (heat-rite recirculating).

Participants of this inspection were also afforded the opportunity of visiting the Pettibone Mulliken Company to inspect core baking and annealing installations. From the Pettibone Mulliken Co. they went via auto to the McCormick works of the International Harvester Co. to inspect the following types of heating operations: Carbonizing (oven type), forging (rod end), heat treating (continuous and oven).

The second inspection trip was on Wednesday, October 12, 8.30 A. M., when 50 visiting delegates went via auto to the plant of the Kedzie Foundry to inspect mould drying installations, then to the Liquid Carbonic Company to see crucible type brass melting furnaces.

The final trip was on Friday morning, October 14, at 8.30 A. M. Sixty delegates were taken via auto to the West Pullman plant of the International Harvester Company and thence by auto to Kramer's Cafe in the aristocratic Hyde Park neighborhood, where ample opportunity was afforded to visit and inspect one of the most elaborately gas equipped hotel and restaurants in the United States. After lunch the visitors were taken via auto to Crane Company to inspect the core baking and galvanizing installations.

Credit is due Mr. D. W. Chapman, of the Peoples Gas Light and Coke Company for these most excellent inspection trips. It is especially notable that nearly 50 per cent of the Industrial Gas Section's attendance were present on these trips. One prominent visiting industrial gas engineer was heard to remark that the inspection trips were well worth many times over the trip to Chicago.

FORGING

William M. Hepburn

Vice-President, The Surface Combustion Company, New York, N. Y.

THE science of forging including the heating of metal for working, is the oldest and least advanced of all the metallurgical sciences. This lack of progress is all the more surprising when one realizes that there has been a constant and pressing need for refinements in the methods of applying heat in this operation for many years. Inasmuch as gas has inherent advantages over all other fuels the potentialities for its expanded use in this field are of great importance to the gas industry. With this in view, efforts are being made to develop modern and economic apparatus for the utilization of this fuel in forging operations.

Forging operations exist in practically every community and are necessarily of universal interest to the gas industry. The present operations represent a potential load of approximately 100,000,000 cu. ft. per year. The intensive interest and agitation which is being given this subject by the progressive manufacturers, indicates that this operation is about to go through a transformation and that the old-time method of brute force will be tempered by many other factors of a scientific nature which, in turn, will give gas great opportunities in this field.

Forging, as generally referred to, is a heating operation preparatory to the mechanical working of the metal. This article is confined to the forging which applies to steel.

The three methods utilized in mechanically working steel today are:

1. Rolling.
2. Pressing.

3. Hammering.

The rolling consists essentially of passing the steel between two rolls revolving at the same speed and in opposite directions. This method was introduced as far back as 1553 and today by far the greatest tonnage of steel is worked in this manner.

All sections such as rails, tie plates and structural shapes are formed in this manner.

Forging Press

The press is an English invention, dating from the year 1861. The action of the press is so slow that a kneading of the metal takes place and penetrates deep into the material. This press produces the most uniform refinement of all the methods of working steel, but its characteristics limit its use to heavy forgings such as gun barrels. The labor required makes it far too expensive to compete against rolling on work that can be so handled.

Hammer Forging

Hammering was the first method employed in shaping metals. The hammer strikes a blow which has the effect of tremendous pressure exerted on a relatively small area for a very short interval of time. The impact tends to localize the effect of the blow and confines the refinement, which is of a high degree, to the exterior. It also performs the important function of knocking scale loose. Intricate parts, such as crank shafts, axles, connecting rods, and automobile gear blanks, are all forged by means of a drop hammer.

Fig. 1

Drop forging, particularly, is a highly competitive field and up to the present time few demands have been made by the customer outside of a minimum cost per forging. Figure 1 shows a typical type of medium size forge furnace. A typical fuel comparison between gas and oil with this type of forge would be:

	Gas	Oil
Size of stock heated	7/8" square	7/8" square
Length of heat pear bar	18"	18"
Number of bars per heat	15"	15"
Temperature of work	2200°F	2200°F
Dimensions of heating chamber	24" wide x 18" deep	24" wide x 18" deep
Weight per forging	.835 lbs.	.825 lbs.
Average output per shift (Test)	3075 lbs.	3034 lbs.
Maximum output of any one shift	3680 lbs.	3680 lbs.
Fuel consumption per lb. steel	3.9 cu. ft.	.02 gals.

Reasons for Improvement

With the present slot forges it is possible to heat sections even as small as 3/4" round at too high a rate resulting in a large temperature differential between core and surface such that the surface may reach the melting point before the core becomes plastic enough for the forging operation. The advan-

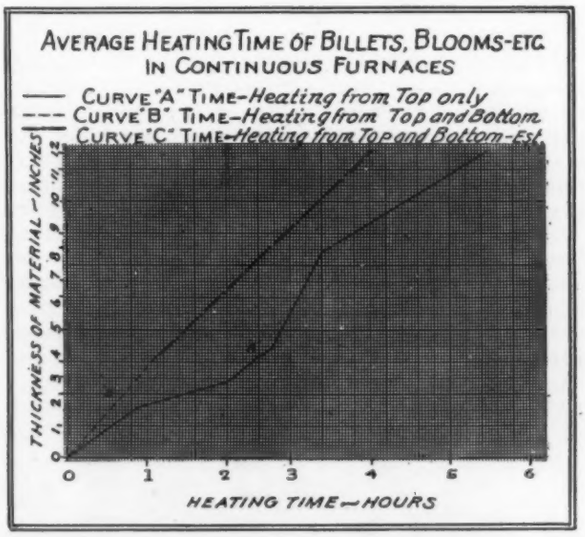

AVERAGE HEATING TIME OF BILLETS, BLOOMS-ETC. IN CONTINUOUS FURNACES
CURVE "A" TIME—Heating from Top only
CURVE "B" TIME—Heating from Top and Bottom
CURVE "C" TIME—Heating from Top and Bottom—Est.
THICKNESS OF MATERIAL—INCHES
0 1 2 3 4 5 6 7 8 9 10 11 12
0 1 2 3 4 5 6
HEATING TIME—HOURS

Fig. 2

tages of uniform heating need not be stressed. Figure 2 shows the time allowance in steel mill practice. To heat a piece of say three-inch round stock uniformly throughout its section to forging temperature would require considerable time, and if done in the present oil-fired forge furnaces, the surface would become scaled beyond the forging allowance. Unless this scale is removed considerable expense is entailed when the blank is machined. When a tool strikes any of this imbedded scale either the edge is dulled, necessitating re-sharpening, or else the setting is thrown off, either of which materially increases the cost of machining.

On the other hand, if the mechanic attempts to take a sufficiently deep cut to keep under the scale there results a considerable loss of metal, which also is very expensive. It is estimated that 30 per cent of the present machine costs are a direct result of

scale formed in forging.

Figure 3, a typical blank forged from a 4-inch square, shows the indentations after the scale has been removed by pickling.

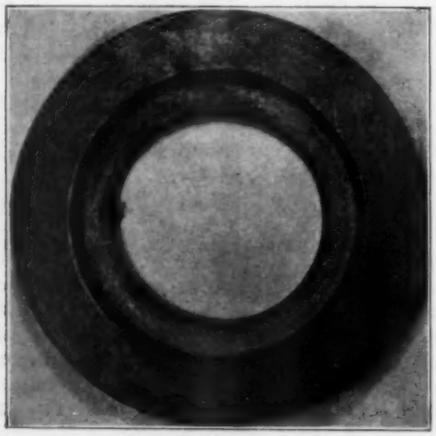


Fig. 3

In addition to the expense caused by the scaling, the grain structure itself can be considerably affected by the conditions under which it is forged. If, for example, the gear blank is forged from a billet the outside of which is at a considerably higher temperature than the core, upon being struck by the hammer the flow of metal takes place almost entirely in the outside sections, the cooler inner core remaining comparatively unaffected. The result is that the refinement due to the mechanical working is restricted to the outer surface and this in turn tends to produce a blank which is not uniform in its composition.

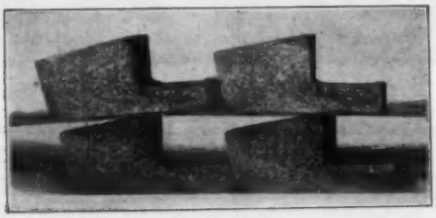


Fig. 4

Figures 4 and 5 are of sections of gear blanks that are etched in order to show the arrangement of the grain after forging.

An improved forge design must provide for high production, long soaking period and non-oxidizing atmosphere. A continuous type of forge can be so adapted as to provide these conditions. An interesting furnace designed to produce these characteristics, shown in Figure 6, provides a muffle construction for soaking the work and preventing any intense action of the gases on the work while permitting at the same time direct action in the preheating chamber. Thus is combined the efficiency of direct firing with the advantages of soaking in a protected chamber. The non-oxidizing atmosphere is obtained by automatic proportioning devices and continuity of production by the sloping hearth. The principles embodied in this construction occupy an important part of the research work of the American Gas Association.

Continuous Forges

Whenever the production so allows, the use of a continuous type of furnace eliminates many of the obstacles which at present obstruct the use of gas

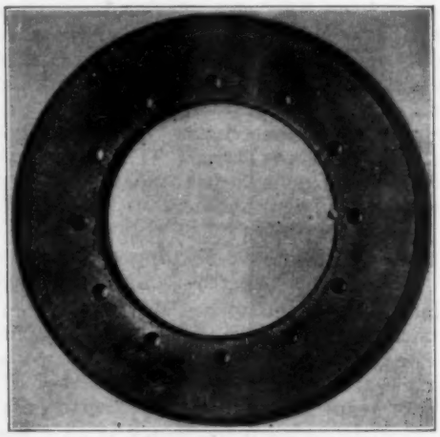


Fig. 5

in spite of the inherent advantages of this fuel. Figure 7 shows a view of a modern continuous type of forging furnace which is being used in heating crank shaft stock prior to drop forging. There are four of these furnaces in this particular installation. Each has a continuous, inclined, water-cooled skid, pneumatic pusher, side-door discharge and is fired with gas, through water-cooled burners. They are 18 feet

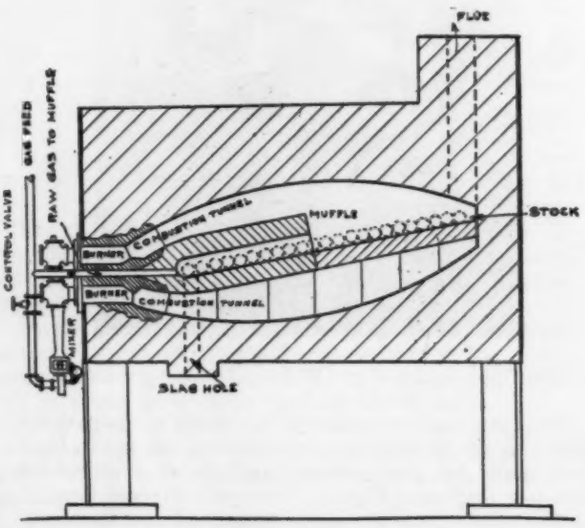


Fig. 6

long, 4 feet wide, and 1½ feet in height to the springline of the arch (internal dimensions).

These units are of firebrick 9 inches thick backed up with 4½ inches of insulation and steel encased. A forging temperature of 2200° F. is maintained, an air pressure of 24 oz. is used and gas is supplied at 1 lb. Each furnace will handle 4,000 lbs. of stock an hour with a heat cycle of 45 minutes.

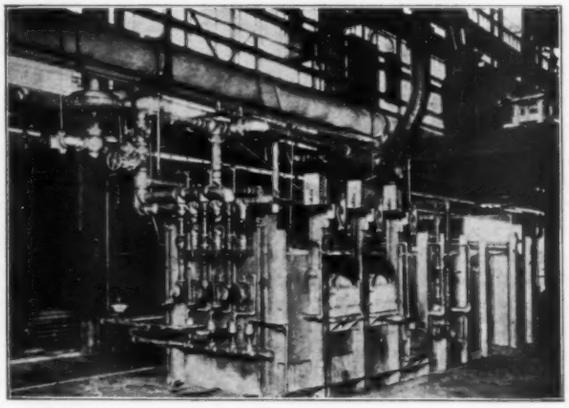


Fig. 7

In other words, it is capable of heating to forging temperature at the rate of 75 lbs. of metal per square foot of hearth area. These units are semi-automatic for the pusher is so timed that the work is pushed through and discharged in the prescribed period.

Automatic temperature controls maintain the temperature constant regardless of production. The firing equipment is of the automatic proportioning type whereby the atmosphere in the heating chamber is maintained slightly reducing. The combustion zones are so located that heat is applied to the work both from above and below. This method of heat application requires only about half the time to heat the work through as the slot type, which fires solely from above. Furthermore, the outgoing flue gases preheat the incoming work so that a high efficiency is maintained even at the forging temperature. Billets weighing 70 lbs. each, 25 in number, have been forged from one of these furnaces in 15 minutes, with no deviation in temperature. Another important factor is that the hammer crews are never held up from lack of hot steel.

The savings in operating costs are well illustrated by the following comparison between four oil-fired forges and the one continuous gas-fired furnace which replaces them.

Comparison of Operating Costs
(Forging)

	Four Oil-Fired Furnaces	One Continuous Gas-Fired Furnace
Fuel—Production	$4,655.00	$3,476.00
Heating up	900.00	350.00
Standby Losses		
Labor	76,800.00	58,800.00
Baintenance	1,000.00	350.00
Steam, Light, Power	.....	.....
Die Life	.....	.....
Increased Production	.....	.....
Fixed Charges		
Hammers (4)	.....	.....
Presses	64,000.00	43,000.00 (2)
Restrike Hammers	.....	.....
Floor Space	6,000.00	4,800.00
Overhead	.....	.....
Total (not considering items left blank)	153,355.00	115,776.00
Anticipated yearly savings		37,579.00

Premises

1. 2,257,000 lbs. stock per year (1,400 pieces stock weighing 6.45 lbs. per 16-hr. day, 250 days per year).
2. Fuel
   Production—Oil 55 gal. per ton.
   Gas 5,500 cu. ft. per ton.
   Heating Up—Oil 1½ hrs. 4 fces.—8 gal per hour.
   Gas 1½ hrs. 1 fce.—2,500 cu. ft.
3. Cost of Oil—7½ cents per gal.
   Cost of Gas—56 cents per 1,000 cu. ft.
4. Labor
   Oil—4 drop forgers at $1.50 per hr.
   4 heaters at $.90 per hr.
   Gas—4 drop forgers at $1.50 per hr.
   1 helper at $.90 per hr.
   ½ furnace leader at $.90 per hr.
   Direct labor overhead 100 per cent.

Regardless whether the units are under production the full term of 250 days per year, the labor, fuel and maintenance are relative to the time the units are in production. The possible savings of 30 per cent or more in fuel and the elimination of labor are only two items that justify the development. The unit, being under full automatic temperature control, can be operated at 50 per cent of capacity and practically the same ratio of savings will be maintained.

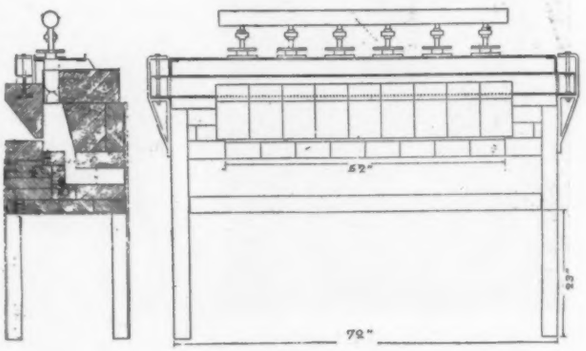


Fig. 8

When operating with only two drop forgers the helper required for removing the flashing can be eliminated.

Rod End Forges

A considerable number of rod-end type of forges are in operation throughout the country. Although the present tendency is to forge bolts cold, neverthe-

less, in a certain grade of work, and especially in the larger sizes, the end-heating operation is required. The usual procedure is to cut the stock to the proper length and heat the end only. After the end has attained a forging temperature of around 2200° F. it is inserted in the bolt-heading machine which upsets the end into the proper shaped bolt head.

The end-heating operation is a particularly difficult one, due to the fact that a high production is desired and only a small portion of the stock is exposed to the heat. This necessitates running forges at very high temperatures in order to maintain the production and seldom has gas been able to compete against the cruder, less expensive fuels, in this application.

The overhead system of firing direct against the work has been advantageously applied to this type of work. Figure 8 shows the arrangement which was worked out three years ago, with the tunnel type of gas burners, in one of the bolt-manufacturing plants.

This furnace made a very good showing as far as the conversion of the present equipment is concerned. The overhead method of firing is particularly severe on the refractories and special materials are required. However, the proper solution to the bolt-heading operations necessitates a heating operation which will enable these pieces to be handled continuously. A modern bolt-heading machine will handle 120 standard ¾-inch bolts per minute. When using slot forges a crew of four men is required for handling the work at this rate. One man at the machine, one man bringing material to the forges, and two men handling material between the forges and the machine operator. An automatic forge in which the material is handled mechanically from a hopper through the forge and delivered to the machine operator will eliminate the work of two of these men, the resultant savings totally eclipsing the fuel costs.

Forging is undoubtedly entering a new era. The advantages which the continuous conveyor bread-making ovens have given the larger bakeries over the "in and out" peel oven of the small jobbing bakeries, the advantages of the tunnel kilns over the old bee-hive kilns in the ceramic field, and the continuous heat-treating units over the old oven furnaces in the metallurgical field apply in even greater force to forging.

C. E. Steinwedell, Chairman

"If we have conditions which might be avoided through study, research and mutuality of understanding, such conditions should be intelligently analyzed and, if necessary, brought to the attention of the industry by our members through this section—thereafter, if necessary, to the technical, commercial, advertising or other sections of our parent association."—E. S. Dickey.

C. W. Berghorn, Secretary

THE type of men in attendance and their interest in the various reports and addresses made for a successful meeting of the Manufacturers' Section. Chairman W. E. Steinwedell, with a few well chosen remarks, stressed the worth of the Manufacturers' Section and outlined the scope of its activities. He called attention to the fact that the section is nine years old and that since 1919 there has not only been a steady growth in membership, but also the number of exhibits has doubled.

The nominating committee, of which Mr. W. E. Derwent was chairman, proposed the names of H. Leigh Whitelaw, American Gas Products Corporation, and James A. Fry, Detroit Stove Works, for chairman and vice-chairman respectively. These gentlemen were elected unanimously and the newly elected chairman spoke of the value and importance

Boone-Chilton

Bituminous Coal meets its most Severe Test in the Manufacture of Water Gas. The requirements of no other Industry are so Exacting.

Boone-Chilton Coals have met these Exacting Requirements to the Highest Degree in over One Hundred and Forty Water Gas Plants.

Boone-Chilton **Generator Coals**

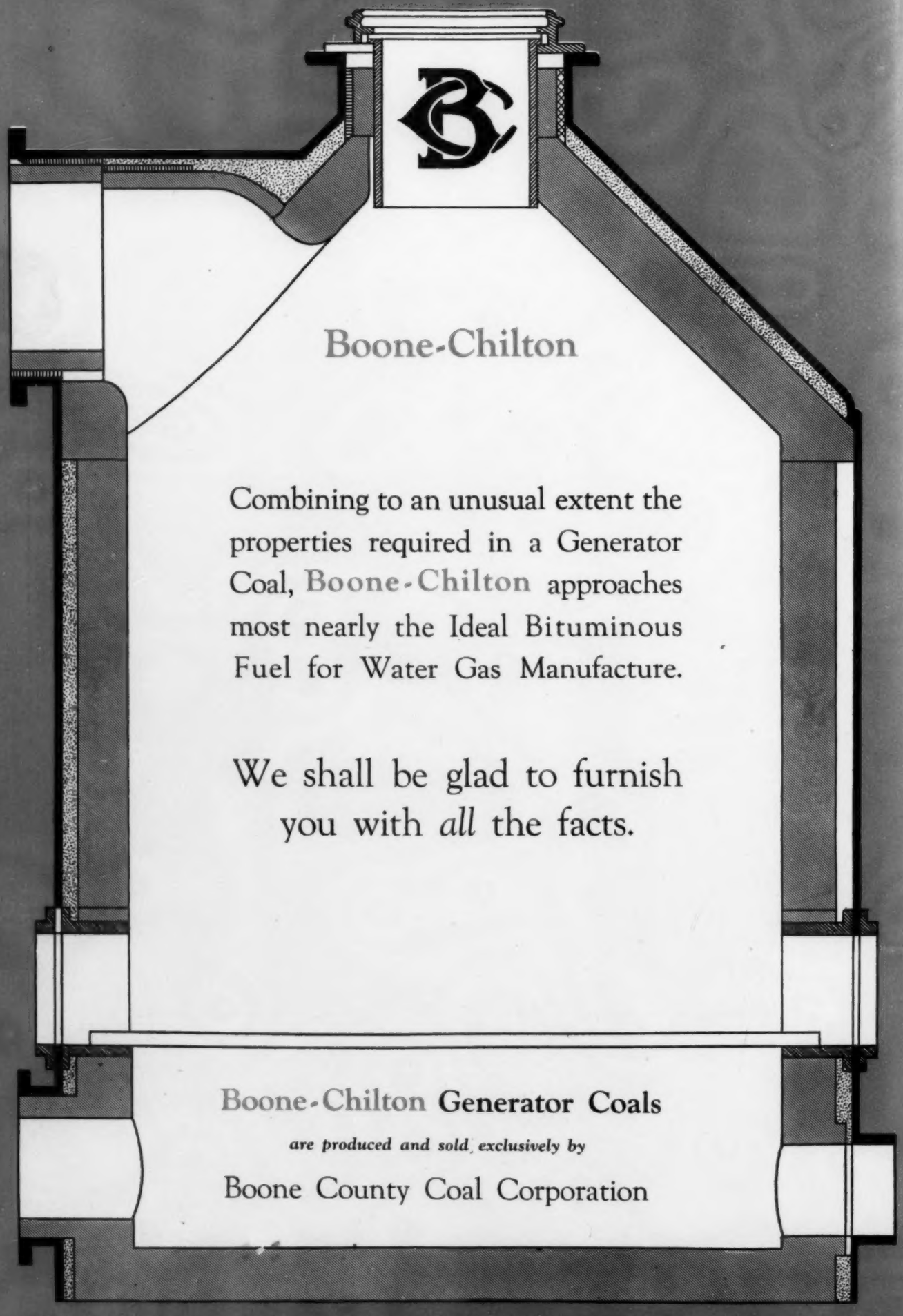
Are Produced and Sold exclusively by

Boone County Coal Corporation

General Sales Offices:
450 Bullitt Bldg.
Philadelphia

Mines and Operating Offices:
Sharples, W. Va.

Western Offices:
630 McCormick Bldg.
Chicago


B
Boone-Chilton
Combining to an unusual extent the properties required in a Generator Coal, Boone-Chilton approaches most nearly the Ideal Bituminous Fuel for Water Gas Manufacture.
We shall be glad to furnish you with *all* the facts.
Boone-Chilton **Generator Coals**
are produced and sold exclusively by
Boone County Coal Corporation

of the A. G. A. Testing Laboratory and advised all to give it their full backing.

When called upon to say a word to the meeting, President Macbeth spoke to the effect that the manufacturers are entitled to considerable credit for assisting in the work of the Testing Laboratory. He further stated that the smaller manufacturers should be encouraged and morally supported by the larger ones to the end that they would produce better appliances and equipment for the industry. President Macbeth made the point that the larger manufacturers should be taken to task if they persist in ignoring the suggestions emanating from the laboratory and other proper sources for bettering appliances.

Managing Director Forward thanked the manufacturer company members for their whole hearted support of the association and its policies, and in line with Mr. Macbeth's remarks, complimented them for their efforts in backing the Testing Laboratory.

Paper by Conner

R. M. Conner, Director, A. G. A. Testing Laboratory, read a paper, "Laboratory Developments," that was of considerable merit and of especial interest to manufacturers of appliances and other similar equipment. Mr. Conner brought out the point that during the coming year a high percentage of the appliances sold will bear the laboratory seal of approval. He further read to the effect that the Canadian Gas Association has adopted the laboratory's code of testing. Interesting mention was made in his paper of the work the laboratory has done to determine the effect of change in the gravity of gas on the performance of appliances.

Mr. F. G. Curfman, Division Chairman, Gas Manufacturing and Auxiliary Equipment, brought out several good points in his report. To quote from this report, the following items are given:

"The adoption of standards have, from time to time, been brought to our attention and some very good work has been done along this line. We all know the economic advantages of standardization and it would seem a logical step for this division to take in appointing a Standards Committee.

"Several years ago the Bench Builders agreed to some tentative gas bench standards relating to horizontal retort benches. These suggestions were published in the A. G. A. Monthly, but so far as I know, nothing was ever done other than making the suggestions. The American Gas Association has a definite committee procedure in regard to adopting standards. They also have a representative on the American Engineers Standards Committee, who will sponsor any standards to the National Committee if presented in the proper form and manner. Providing the matter of bench standards is at present of sufficient importance to be put into effect, we can, through an authorized committee, assist our members in adopting either A. G. A. stadards, tentative or permanent, or national standards, endorsed by the American Engineers Standards Committee."

Matter of Appraisals

"A great many requests have been received by our members from various appraisal companies, state and city commissions, for prices on apparatus and equipment to be used for valuation purposes. We are frequently asked to quote prices representing current and past values on apparatus that we do not manufacture and are usually expected to give this information gratis. It would seem fitting that on account of the time consumed in preparing such data it would be just to make an adequate charge for such services and quote only the prices on apparatus or equipment furnished, and then only by the consent of the officials operating the utility. The manufacturer or builder is best qualified to appraise the replacement cost new for any period of the equipment he originally furnished or installed, and he should be sufficiently compensated for his time to prepare a carefully compiled estimate. Whether the amounts charged for this kind of work by each of us be the same is an open question. However, we should supply the work under uniform conditions and if adhered to, would make the information given out more complete and accurate."

There was some interesting discussion as to this latter point, but all seemed to be of the opinion that Mr. Curfman had brought to light a condition that would bear further investigation. It was moved and seconded that a committee of two be appointed to investigate and report on this matter.

E. S. Dickey's Report

The report on distribution equipment, read by Chairman E. S. Dickey, contained matter of considerable moment. Mr. Dickey spoke of the lack of answers and attention to the communications sent out by his committee requesting information and suggestions pertinent to their line of work. Mr. Dickey read in part: "Under these nineteen inquiries thirteen replies have been received, the thirteen replies being classified—three merely advertisements, with catalogs; seven without suggestion, and three only with suggestions.

"Two of the three suggestions received show absolutely no connection with any question of distribution problems; one referring to soil conditions in respect to erection on new plants or plant additions, the second referring to the amount of dues now paid by the Manufacturers' Section and the restricted opportunities enjoyed by the manufacturer members for any participation in the general meetings of the American Gas Association conventions. The third suggestion related to the matter of standardization on equipment."

The report went on to state that after twenty-nine additional inquiries of a broadened nature were sent out only six were received with suggestions. These six were submitted by appliance manufacturers and had no connection with distribution problems. According to Mr. Dickey, there is evidently a lack of understanding and a misconception as to the Manufacturers' Section activities and objects. "If," the report reads, "we have conditions

in the gas industry which might be avoided through study, research and mutuality of understanding, such conditions should be intelligently analyzed and, if necessary, brought to the attention of the industry by our manufacturer members through this section—thereafter, if necessary, through proper channels, to the technical, commercial, advertising or other sections of our parent association. Under such orderly procedure, recommendations from this section should and, we feel assured, would receive due consideration from these other sections and from the industry as a whole."

Mr. Dickey also dealt with the value of the gas meter as a properly functioning apparatus, in accurately measuring the gas supplied to the customers. He further discussed the effects of sulphur, naphthalene, "stripped" gas, etc., on mains, services, meters and appliances. The purport of these latter items was to show that distribution equipment might fail and be blamed for bad performance when as a matter of fact the root of the evil might have its inception in the works itself.

In concluding, Mr. Dickey recommended that his report be submitted to the technical section for a consideration of the engineering and chemical problems indicated therein.

Mr. R. C. Hoffman, Jr., Division Chairman, Utilization Appliances, showed by his report that the gas consumers must be educated to better service and to this end better appliances must be developed. In other words, he contended that the consumer will get a bad and erroneous idea as to gas service if he has to contend with poorly designed and inefficient appliances. Mr. Hoffman's observations were well received by those in attendance and keyed in well with the work of the Testing Laboratory.

Mechanical Office Equipment was handled by Mr. A. S. Trew, division chairman, who stated that this division was keeping abreast of the progress made in other lines of gas industry activity by recommending the best available office equipment and procedure.

Considerable credit is due Mr. Berghorn of the American Gas Association for his handling of the exhibits as well as his activities as secretary of the Manufacturers' Section.

Potter Studio, Newark, N. J.
Harlow C. Clark, Chairman

"If the newspapers do not want to restrict the professional space-grabbers, who are especially inimical to business and industry, they might at least give business and industry a 30 or 40 per cent break in presenting our side, if an even break is too much."—B. J. Mullaney.

Blank & Stoller, N. Y.
C. W. Person, Secretary

THIS section of the convention procedure which is concerned largely with the matters of advertising and publicity was addressed by a number of prominent executives well qualified to discuss their particular subjects.

In the opening remarks of Chairman Harlow C. Clark, The Public Service Electric and Gas Company, Newark, he noted how present-day competition in all lines of business has become intensely fierce and how such striving calls for the persistent use of selling and advertising efforts.

Mentioning the scope and duties of the various State committees on public utility information he dwelt on the fact that during the past twelve months

there has been a decided increase in the amount of gas news published in the newspaper space purchased for all sorts of utility advertising.

In the financial field also this publicity has been going over with good results. "A recent survey made of some 590 salesmen of leading security houses to draw out opinion on the merits of gas company securities gave the section some valuable information which it is now using in its publicity matter," said Mr. Clark. "The financial stability of the industry, its steady record of earnings, the soundness of its public relations, fair and impartial regulation and record-breaking sale of its product are factors tending to improve the price of gas securities and to build up demand for increasing volume of financial publicity on industry."

Mr. Clark commended the work of the Testing Laboratory in Cleveland and the national consumer survey of the industry's market. He also praised the editorial staff of the A. G. A. Monthly and the good work it is doing as regards this publication.

Among those making addresses during the symposium, over which Thomas N. McCarter presided, were: P. H. Gadsden, "The Questions at Issue"; R. H. Aishton, "The Public Interest in Transportation"; Henry R. Hayes, "The Financial Stability of the Public Utility Industry"; Cornelius J. Doyle, "The True Functions of Government," and B. J. Mullaney, "Space Grabbing in Newspapers." This latter address is given below in full—it is well worth reading.

SPACE-GRABBING IN NEWSPAPERS

By B. J. Mullaney

Vice-President Peoples Gas Light and Coke Company, Chicago

THE public utility industry is at times accused of attempting this by means of the usual press-agent methods, more or less disguised. On the contrary, as we see it, public utilities are victims much oftener than beneficiaries of space-grabbing.

Our industry is not unique in this. Other industries have similar experiences. Familiar examples are the multitude of head-lined proposals for putting the government into business, in competition with, or to the exclusion of, existing businesses, as well as proposals for "curbing"—that "curbing" is a pet word of space-grabbing propagandists—or otherwise dealing with this, that or the other industry.

The public utility industry may at present be getting an undue share of attention from that particular breed of space-grabbers because it is so large, although relatively so new, and therefore conspicuous. But on the whole the intrinsically worthwhile doings and developments of business and industry generally appear to receive far less newspaper attention than statements, proposals and enterprises inimical to business and industry.

I am not sobbing about this nor complaining of its existence. I am only drawing attention to it in the hope of getting more light on the reason why of it and its inconsistencies and anomalies.

A Paragraph Near the Want Ads

Let the propagandists propose "curbing" the public utilities in any respect and they get on the first page or near it. The utilities expend brains, energy and much money on real development of inestimable value to the general public and get—maybe—a paragraph over near the want ads.

The American Gas Association Testing Laboratory at Cleveland, for example—an institution for standardizing safety and efficiency in gas ranges and all other appliances—is of vastly more practical, tangible value to the public than any "curbing" proposal within my time. But if we suggest that "news" of that kind deserves more space than it gets, use of the advertising columns is intimated.

We do not resent the advertising suggestion. Indeed we make use of it—abundantly—to the aggregate amount of $25,000,000 or $30,000,000 a year for public utility advertising. But we are naturally somewhat irked by the discrimination. It seems a bit one-sided that we should have to depend upon paid advertising to offset space-grabbing propaganda that is certainly not entitled to any more consideration, on account of intrinsic importance and public interest, than our story is.

The professional "curbers" never spent a nickel for advertising, and do not intend to. Newspaper encouragement of them is therefore in a way evidence against the accusation that newspapers are utterly venal. For the newspaper must know that, if public utilities were to become government-owned, the millions of advertising revenue now drawn from them would be cut off.

Our News is Superior

The "news" of the space-grabbing propagandists is hardly superior to our "news," according to any tangible and definable standard of news value. Some millions of American citizens make their living in the employ of the public utilities. Other millions have some billions of their own dollars invested in public utilities. Practically everybody uses one or more kinds of public utility service—gas, electric, street car, telephone. What those utilities are doing —not going to do, but are doing—for more and better service would seem to be as important and interesting to the public as announcements that some professional "curber" is going to get somebody—maybe —to introduce a bill at Washington, Albany, Harrisburg, Springfield, or elsewhere. But the "curber" wins in the space-grabbing.

Take the details of rates. In the annual cost-of-living expenditures for the average American family, the combined expenditure for gas, electricity, street car rides and telephone service is only about six per cent of the total living cost expenditure. That is inconsequential in comparison with the usefulness of bettered services or in comparison with other cost-of-living items. But to judge by the head-

lines you might think a gas or light bill reduction of 10 or 15 cents a month was the most important news in the world.

This diversity in permitted space-grabbing, this discrimination against legitimate business and industry in favor of professional propagandists, is especially noticeable in what comes out of Washington. Almost any group there, with an ingeniously constructed name implying a "public interest," can grab space for propaganda that is frequently downright libel. And the newspapers using it seldom make even a pretense of giving the other side a hearing.

Why the Discrimination?

This discrimination—is it simple carelessness or something else? It is scarcely attributable entirely tc the intrinsic importance of what the propagandists say, or to the superiority, and consequent importance, of the sayers as men and citizens. The Cortelyous and Owen Youngs of the public utility industry are hardly outclassed, as men or citizens, by the Pinchots and Basil Manlys of propagandaland. Therefore again: Why the discrimination?

When the why of prominence given to certain classes of news is questioned, the stock newspaper answer is: "We give the public what it wants." But do they really know always what the public wants? If they always do, singly or compositely, shouldn't we find newspapers read regularly by practically everybody who can read? As a matter of fact, great numbers who can read seldom or never look at a paper. Or if editorial judgment of what the public wants is even approximately as correct as it is assumed to be, shouldn't we find closer agreement between the papers and the public as expressed in election returns? The fact seems to be that editors are no better than the rest of us at guessing the political preferences of the public.

All of which suggests that use of space-grabbing propaganda, as well as other editorial manifestations, may be considerably influenced by prejudices, preconceptions and a habit of thinking, without any particular rhyme or reason, that one thing is "news" and something else equally important or interesting isn't.

Personality Factor Looms Large

Another factor perhaps is the interest of newspapers in personalities rather than in ideas. It is easier to deal piquantly, picturesquely or sensationally with personalities. The Peace Ship, for example, to "get the boys out of the trenches by Christmas," was practically worthless, if not ridiculous, as an idea; the Henry Ford personality made big news of it. When professional propagandists shoot at an industry, they seem to pick always a big one with conspicuous personalities in it, and the personality factor works for space-grabbing, although with "reverse English."

The workings of the same factor in a variety of ways is apparently observable. Almost any self-appointed "friend of the people," regardless of his personal unimportance, seems able to make the headlines by blackguarding an industry or some conspicuous industrialist, and the blackguarded have little or no redress.

A period of unusual expansion comes to an industry, as it has in light and power. Its rapid growth necessitates new expedients in financing. Its success attracts financial adventurers—inflation schemers—as sugar attracts flies. Incidental and isolated consequences of their activity are then made an excuse for indicting the entire industry. On the other hand, unwary investors are fleeced to the tune of $700,000,000 to $1,000,000,000 a year by means of fraudulent securities—oil, mining, land or industrial—but with no conspicuous personalities in it, the world-savers ignore it.

In none of this would I be understood as criticising the way newspapers are made. The men who are making them are doubtless better at the job than I would be; otherwise I would probably be working at it. As stated before I am only drawing attention to certain apparent circumstances in the hope that it may lead—somebody, somewhere, perhaps, to less partiality in permitted space-grabbing.

"Small Favors Thankfully Received"

If the newspapers do not want to restrict the professional space-grabbers, who are especially inimical to business and industry, they might at least give business and industry a 30 or 40 per cent break in presenting our side, if an even break is too much. If they do not want to do that, we shall simply have to go along as we are going, in tune with the old bromide: "Small favors thankfully received; larger ones in proportion."

At that we are not doing so badly. In spite of the apparent inconsistencies and anomalies referred to, the public utility industry, as well most other industries, now gets much fairer newspaper treatment than it did some years ago. Much of the change is attributable to our own mild ventures into space-grabbing. There has been more consistent effort in recent years to make the real news of the industry more easily accessible to newspapers. They have in most cases met us half way, accepting and using our information when it appealed to them as legitimate news.

That is all to the good and we appreciate it. As for the other side of the picture—the pins stuck in us—perhaps the David Harum philosophy about dogs and fleas is applicable: A reasonable number of fleas are good for a dog "to keep him from broodin' on bein' a dog." If our industry were to become a newspaper pet, we might all get fat and lazy and that would not be good for either personal or corporate health.

Blank & Stoller, N. Y.
W. C. Beckjord, Chairman

"If the industry attains the degree of success in the future that it expects, it must do so against serious competition from other fuels. Tradition which has guided the industry more or less in the past must be forgotten and more attention paid to research and economics." — Engineering and Economic Survey of the Gas Industry.

H. W. Hartman, Secretary

FIVE afternoon sessions of the convention were devoted to programs of the Technical Section, three dealing with engineering and general problems and two, held simultaneously, with chemical subjects. Mr. W. C. Beckjord, sectional vice-president, assisted by Mr. H. E. Bates as vice-chairman, presided over the engineering sessions. Mr. H. W. Hartman, secretary, and Mr. A. Gordon King, service engineer, both of the headquarters staff of the Association, served as secretaries and business managers of the sessions.

All of the program material at these sessions centered around the work of the five principal technical committees of the Association, the Economic and Engineering Survey Committee, the Carbonization Committee, the Water-Gas Committee, the Distribution Committee, and the Chemical Committee. The material presented is, therefore, best reviewed in five corresponding portions.

In view of the great importance of the economic and engineering work in progress in this section it was deemed important that the officers who have served so effectively in starting this work be continued in their positions another year. This idea met with enthusiastic support from the members in attendance and re-election was unanimous of Mr. W. C. Beckjord and Mr. H. E. Bates as vice-chairman of the section.

ENGINEERING AND ECONOMIC SURVEY

Summary of Committees' Investigations and Preliminary Reports

Mr. H. E. Bates, of the Peoples Gas Light and Coke Company of Chicago, has served as chairman of the Committee on Engineering and Economic Survey of the gas industry. His report was, therefore, a general summary of the problem which has occasioned this investigation and of the present status of the work. Some of the outstanding points presented by Mr. Bates' report to the convention are given below. Those who desire to go into this matter further, and it is a subject well deserving of that attention, can procure from the Association headquarters copies of Mr. Bates' report and the supplemental pamphlets by Messrs. Mix, Haggerman, Lydecker, Shawn, Perry, Willien, Fieldner, and Weaver, which supplement the general report and present special phases of the projects under study. Brief extracts from these special reports are also included, but the limitations of space available prevent giving all of even the important technical material which is available to the industry in this very valuable set of articles.

1927 Progress Report

The industry is looking forward to success largely through the means of large volume sales of gas and the public is looking to the industry for a great convenience and benefit to public health through the use of

gas for house heating. This change in the character of our loads, the probable scarcity of certain fuel extensively used in the industry, and other important factors are of first importance at the present time, and it behooves the industry to take an inventory of itself and consider the effects of future conditions on present methods and processes.

An economic survey of an industry such as the gas industry is a tremendous task and involves almost every branch of the industry from the coal pile to the appliance. It must include investment and operating costs, rates, utilization and other factors controlling the economic structure.

Investment Costs

During the past year statistics have been obtained from fourteen companies and an analysis of these statistics has been set up for the purpose of comparing conditions in 1925 with those of 1915. In order to make such statistics comparable, investment costs used have been adjusted to 1925 price levels. Table I shows the results of this study. While the sale of gas has increased more than 10% over the past ten years, the number of meters has increased only 46%. This is a very favorable situation, resulting from increased sales per meter, principally due to industrial business, although house heating has been a factor in some of the companies. The benefits of increased sales per meter are reflected in the reduction per MCF sold. The marked reduction in distribution investment per MCF sold of 35% between 1915 and 1925 indicates that systems are taking care of additional loads, partly due, perhaps, to the fact that the systems when installed had spare capacity.

This favorable comparison of the past ten years, however, should not cause the industry to become too optimistic and expect the same improvement over the future years. It is believed that the same improvement in the future can only be attained by reason of the industry making every effort to analyze its condition and formulate ways and means to meet the problems of the future.

Unless our rates are low enough certain industries requiring large volumes of gas in their operations may find it to their advantage to install their own gas producing plants. This is the most attractive type of business for the gas industry as it usually has a very good load factor and the volume of gas required is large. Every effort should be made to obtain such business before these private plants are installed, for once installed the rates must be lower by the amount of fixed charges than it need be if the business is obtained before the plant is built.

Aside from the industrial possibilities the industry is most concerned about the house heating business. There is no doubt that extensive house heating loads are going to cause tremendous daily peaks over the winter periods. This will result in additional capacity installations which will have a very limited use and under such limited operation it is of first importance that this capacity be low in first cost even though the operating costs may not be the most economical.

Plant Investment

The character of the service rendered makes it necessary to provide production capacity for maximum days requirements even though the average daily requirements over the year are much less. This results in a considerable portion of the investment being idle a greater portion of the year. Statistics of a number of companies show that the annual daily load factor is approximately 66%, or in other words, the maximum output of the production plant was only used the equivalent of 241 days per year. It may be assumed that a certain amount of reserve production capacity is provided over and above maximum days requirements, and this being true, the equivalent use of the invested capacity was less than 241 days per year. This limited use of capacity results in a high rate per MCF for fixed charges so it is important that investment costs of production equipment be kept as low as possible.

House heating business will reduce the annual load factor as it has a load factor equivalent to only 101 days use of capacity in northern climates. It is a load directly proportional to the outdoor temperature and in northern climates especially will require large investments to meet maximum demands caused by the very cold winter days.

Most companies today having very little house heating load have a maximum day's send-out between two and three times the minimum day's send-out. Extensive house heating would materially increase this ratio. One western property having about 30% of its total sales house heating, reports a ratio of more than four to one. It is reasonable to assume that extensive house heating will result in the maximum day being five or six times the minimum day with a resulting poor load factor.

This makes it very important that careful study be given to the type of plant installed to meet future load requirements. For base load requirements the choice of plant should be governed primarily by low operating costs, but for peak load requirements low investment costs are perhaps a more important factor than operating costs.

Distribution Investment

More than 60% of the total investment in production and distribution equipment is represented by distribution equipment, most of which represents investment in pipe buried in the ground not easily accessible for observation as to its condition.

The average annual load factor of most distribution systems does not exceed 30% to 35%, or in other words the system is being used at its maximum, only the equivalent of 2,628 to 3,066 hours out of a possible 8,760 hours per year.

The house heating load in northern climates has an hourly load factor of approximately 25%, but due to the diversity between the maximum hour of the house heating load and the present load, the effect upon the system hourly load factor is not so marked.

If ways and means can be found to make present distribution systems do more work, the additional investment required as a result of house heating should be kept to a reasonable amount considering the additional business obtained. This can be accomplished by raising pressures of the gas distributed and installing regulators on every service if necessary.

Operating Costs

Operating costs are largely labor and material which offer little hope of being lower in the future. While there is considerable difference of opinion as to whether

the price of oil will become prohibitive in the future there is certainly sufficient possibility to cause the industry to plan plant investments so that the use of oil will be reduced to a minimum. Most companies today are following this plan, and are installing coal gas equipment to a large extent as fast as possible. This should result in lower operating cost, providing a satisfactory market can be had for the by-products, especially coke. But assuming a large increase in the installation of coal gas equipment, it would follow that enormous amounts of coke and other by-products will be produced and must be sold, which if greater than the demand requires would result disastrously for the industry.

It is possible that this situation may be avoided and the supply and demand controlled by combining the gas and electric utilities. Much is heard today about low-temperature carbonization and the possibility of using the coke produced by this method for steam production in electric plants. While such methods have not been entirely successful as yet, such a combination of gas and electric utilities might be of benefit to both.

As production capacity is required it may be assumed that for conditions in the eastern and mid-western parts of the country coal gas capacity will be installed just as fast as base load conditions will permit. This will replace for base load conditions an equivalent amount of old capacity of higher operating costs, such as carburetted water gas capacity, and such capacity will be available as peak load supply. Since this water gas capacity is already invested it is economical to continue its use for peak loads even though its operating costs may be high. There seems to be no reason to assume that the new load conditions will cause old equipment to become obsolete.

A problem to be met and solved in carrying out this plan is that of gravity. If coal gas production is to be installed for base gas requirements such base gas will be low in gravity as compared with peak load capacity supplied by water gas having a higher gravity. It is not believed that satisfactory service, especially to industries, can be provided where appliances would be subjected to a gas varying in gravity from .40 to .65. The standards of gravity for base load and peak loads must be brought closer together either by mixing coal gas with a heavier gas such as producer gas, or by adopting some method of making a lighter gas in a water gas set.

That of producing a lighter gas in water gas sets is the preferable method because of the resulting increased capacity in mains and pumping equipment.

Efficiencies of Processes

Efficiences of processes are reflected in operating costs The greater the efficiency the lower the operating costs.

The gas industry may well be proud of the thermal efficiencies of its processes. The carbonization committee has recently conducted a series of tests on various types of carbonizing plants using the same coal in each test, and the results indicate that thermal efficiencies as high as 80% are being obtained. Allowing 5% for unaccounted for, and many systems have less than 5%, the industry is able to deliver in the form of gas or valuable products 75% or more of the heat input.

When it is considered that the best electric plants in the country do not exceed 20% (and the average of all plants is considerably less than 20%) in thermal efficiency the industry is indeed justified in being proud of its processes. Not only is the efficiency of our processes much better than the electric industry but the operating cost of producing equivalent energy in the form of heat in gas producing stations is much lower than in electric generating stations.

From the standpoint of investment, the gas industry has a good margin in its favor over the electrical industry. On the basis of 100% load factor the investment in electrical plants and distribution systems is about $12 per million B.t.u. On the basis of 530 B.t.u. gas the investment in gas equipment and distribution systems with 100% load factor is about $4 per million B.t.u.

This advantage in investment in favor of the gas industry is largely due to the fact that holders make it possible to store gas for peak hour loads and therefore the production equipment need only be installed for maximum twenty-four-hour demands. Since holder installations cost approximately one-third to one-fourth as much per MCF of capacity as production equipment this represents a large saving in investment.

However, something further should be stated regarding the efficiency of use of gas. It must be admitted that the efficiency of appliances, especially some industrial appliances, is not very high. In many cases the overall efficiency from the coal pile through the appliance is so low that gas cannot compete with electricity even with the great advantage which gas has over electricity to the appliance.

Improved appliance efficiency must come through coordination of the efforts of the appliance manufacturer and the gas industry. It is very encouraging to note that a research fund has recently been established by the gas industry for this purpose.

Load Factors and Costs

The main reason for the slow turnover in our business is the fact that the plant load factor is only 66% and the distribution load factor is only 30% to 35%. The result of this is that between 25 cents to 30 cents of every $1 of gross income is required to pay fixed charges. Assume that these load factors could be materially increased. In that event the fixed charges would be reduced proportionately and in addition operating costs should be reduced.

The disturbing factor to this picture, however, is the fact that the house heating business will tend to reduce existing load factors instead of improving them, and only to the extent that loads can be obtained to offset the poor load factors of house heating can we expect to improve or at least maintain our present economic condition.

However, it may be assumed that the house heating business will have to bear its own expense in the rate established, and this being true such a condition may be helpful in obtaining industrial business. If the house heating business requires a rate which includes the fixed charges on equipment required for maximum day's output and such equipment or at least a portion of it is idle ten months of the year, then any business which would cause such idle equipment to be used during these ten months need carry only a portion of the fixed charges in its rate. The electric industry has long recognized this principle and made very low rates for such off-peak business.

Economic Committee's Program

What has been presented above is a statement of the economics of the gas industry, all of which and more must be studied by the committee before it will have completed its work. More specifically the problems which the committee must study and analyze are as follows:

1. Load characteristics of future business.
2. Standards and quality of our product.
3. Mixtures of gases.
4. Types of various production equipment considering effect of load factor on operating costs and fixed charges.
5. Reducing cost of distribution investment per unit of capacity and making present systems handle increased loads.
6. Ways and means of lowering operating costs by using cheaper fuel and minimizing the use of oil.
7. Adustments of present processes if necessary to meet changing operating conditions so that present equipment will not become obsolete.
8. Economics of off-peak business so as to utilize equipment required for maximum loads during such off-peak periods.
9. Use of plants during off-peak seasons to produce chemical products.

Subcommittees have been organized by the general committee and assignments given each one for study and report to the Economic Committee.

House Heating and Distribution Costs

Three sub-committee reports were also presented. The first of these was by Sub-Committee "A," under M. I. Mix's chairmanship, to which was assigned the task of studying and reporting on the cost and the best method of providing for a gas house-heating load equal in volume to the present maximum hour's send-out on the distribution system. This sub-committee, after much discussion, determined on a procedure which it described as follows:

It was finally decided that the best method of solving this problem would be to work out a sufficient number of cases of actual distribution system, which would be fairly representative of the various types of distribution systems to determine the additional investment and the most practical and economical methods of procedure. It is hope that when these reports are analyzed that general deductions can be arrived at regarding the problem at issue, with the idea, if practical, of applying these conclusions to the gas industry as a whole. For instance, a figure may be found which would represent a fair average for the additional investment and means of procedure for low-pressure distribution with holder as a source of supply, another for low-pressure distribution system with booster mains or district governors as a supply, and still another for high-pressure distribution. This survey would probably show the types of distribution systems which could economically take on this quantity of house heating load, and other types of systems which were not as adaptable and would require larger expenditures to take on this load. The trend of the methods for expanding the distribution systems to take on this increase in load would be shown in a general way

Following this procedure the committee carried out a careful study of several typical city systems and presented in its report data and charts showing losses of pressure on distribution feeders with various gas house-heating loads. Chart No. 3 of that series, which is typical of the entire group, is reproduced to illustrate the manner in which the pressure on the distributing system is related to the distance of the customer from a district regulator. The work of the committee is being

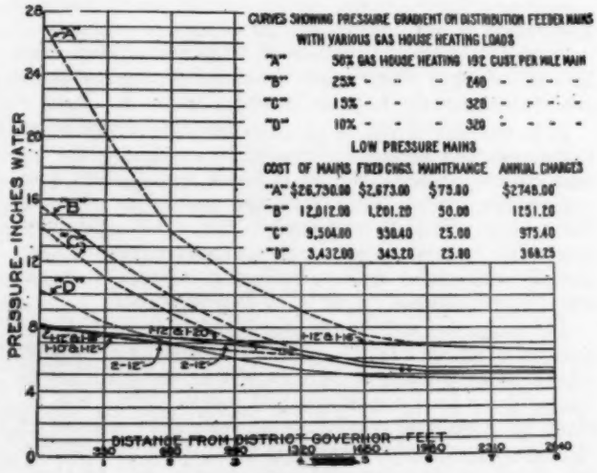

CURVES SHOWING PRESSURE GRADIENT ON DISTRIBUTION FEEDER MAINS
WITH VARIOUS GAS HOUSE HEATING LOADS
"A" 50% GAS HOUSE HEATING 192 CUST. PER MILE MAIN
"B" 25% - - - 240 - - - -
"C" 15% - - - 320 - - - -
"D" 10% - - - 320 - - - -
LOW PRESSURE MAINS
COST OF MAINS FIXED CHGS. MAINTENANCE ANNUAL CHARGES
"A" $26,730.00 $2,673.00 $75.00 $2748.00
"B" 12,012.00 1,201.20 50.00 1251.20
"C" 9,504.00 950.40 25.00 975.40
"D" 3,432.00 343.20 25.00 368.25
PRESSURE-INCHES WATER
DISTANCE FROM DISTRICT GOVERNOR - FEET

Chart No. 3

continued in order to develop additional data and permit summaries which would be of more general application.

Supplying Suburban Areas

The report of Sub-Committee "B," under the chairmanship of O. S. Haggerman, dealt with the problem of supplying suburban or outlying areas to which the population has moved or is moving. Particular attention was given to the relative merits of low-pressure and high-pressure systems to care for such areas. The most important conclusions presented by the committee are summarized by it as follows, but further work is contemplated and the present valuable summary of data is, therefore, only partial treatment of the subject.

1. The most economical means of supplying outlying territory, given favorable soil conditions or an effective but inexpensive pipe coating, is with a high-pressure system.

2. The investment cost, including compression equipment, of covering an outlying territory with a high-pressure system requiring 125 miles of main will be approximately 60% of the cost of a low-pressure system. The more this 125-mile system grows the less will be this percentage. A larger system, as shown by Study "C," with an ultimate system of 300 miles of main will lower this percentage to approximately 50%. The reason for this is twofold. First, a high-pressure system as initially installed has more potential capacity than a low-pressure system, and extensions to this high-pressure system can be made for half the low-pressure cost; second, compression equipment initially installed for a small system usually is larger than immediate need calls for, costs more on a unit basis, and is a much larger percentage of the total cost than it is for a larger system.

3. In round numbers and on the basis of 15% fixed

charges on the high-pressure system and 13% on the low-pressure system, the high-pressure fixed charges will vary from 70% of those for low pressure on the small system to approximately 60% on the large system.

4. Actual fixed charges of the high-pressure studies range from 63 to 69% of those for low pressures and show a cost of from 18 to 25 cents per M less than low pressure.

5. Transmission and distribution expense of high pressure will vary a great deal, but on the average high-pressure expense will be higher than low-pressure by the cost of compression Assuming relative costs of 12 cents per M for low pressure and 17 cents per M for high pressure, a difference of 5 cents per M, total cost of high pressure, including fixed charges and transmission and distribution expense, will vary from 68 to 80% of the cost of low pressure. High pressure shows a net total cost of from 16 to 20 cents per M less than low pressure.

6. The relation which fixed charges bear to the total cost per M of gas delivered to the consumer, including fixed charges on transmission distribution and compression equipment plus transmission and distribution expense is as follows:

	H. P.	*L. P.*
Small system	72.5%	84.0%
Large system	56.0%	79.0%
Existing system	72.6%	83.2%

7. Leakage is probably higher on the high-pressure system, but with a system properly installed under good soil conditions or properly protected the committee feels that there is still plenty of leeway in the economies of the high-pressure system for outlying areas to more than overcome any additional expense due to leakage.

8. Dehydrated gas is an essential for the most satisfactory operation of high-pressure systems. Its advantages are:

a. Eliminates internal corrosion and deterioration of all physical equipment on the system.

b. Eliminates drips and drip pumping.

c. Eliminates freeze-ups and stoppage.

d. Eliminates practically all trouble with service regulators.

e. Decreases maintenance of system.

f. Cuts down complaints to a minimum, thereby giving the best possible service.

g. Longer period of service for meters before being brought in for routine tests as well as more accurate registration by meters in service.

9. It is the consensus of opinion that for outlying areas a high-pressure system will give better service than a low-pressure system, and this is especially true where dehydrated gas is distributed.

Long-Distance Transmission

The economics of long-distance high-pressure gas transmission in order to reduce to a minimum the number of manufacturing plants was the problem attacked by Sub-Committee "C," which made a progress report through its chairman, Mr. F. A. Lydecker. This committee's report, though of the sort that cannot be abstracted, is one of the most valuable engienering contributions to the discussion, because it makes very clear to the executive and engineer how he can properly determine when to maintain centralized manufacturing plants with high-pressure transmission and when to establish separate manufacturing works.

The committee considered a variety of assumed production costs and a variety of conditions as to transmission costs, and in the form of very simple curves brings out its conclusions for the hypothetical cases in such a form that the engineer can take off directly from the curves any desired combination of data. It is, for example, feasible by use of these curves to work out the maximum distance to which gas can be transmitted with varying load factors, varying pressures, varying size of main, and varying total gas requirements, assuming any desired value for the relation between production and transmission expense.

Maintaining Constant Specific Gravity

In order that satisfactory service be rendered to customers there must be a reasonable uniformity in the specific gravity of the gas, because otherwise the stoves and appliances will not behave uniformly. This problem is a critical one in any case where the mixing of water gas and coal gas in varying proportions is essential in order to take care of varying loads.

Mr. George B. Shawn, laboratory supervisor at Cleveland, presented a report on this experimental investigation, showing how various mixtures of coke-oven gas, water gas, producer gas, and natural gas had been tested. Preliminary results only are available with respect to appliance behavior when the specific gravity of the gas is changed. Mr. Shawn summarized the test results available on this phase of the subject as follows:

1. If appliances are adjusted for water gas, coke oven gas, or a mixture of the two, the composition of the gas may be varied by mixing the two gases within the limits represented by specific gravity changes of not more than 20 per cent. upward, nor more than 10 per cent. downward from that of the adjustment gas without causing unsatisfactory appliance operation.

2. A sufficient study of all the factors involved has not yet been made to permit a definite statement on the effect of specific gravity alone. A wide difference in gas composition such as occurs, for instance, between mixtures of natural and manufactured gases and those composed of manufactured gases alone may bring forth results different from those so far found. However, the composition of manufactured gases is sufficiently similar to indicate that the effect of a certain percentage change in gravity would be very nearly the same with all of them. The composition of coal gas or oil gas, indeed, is so nearly identical with that of the coke oven gas that we may say definitely that mixtures of water and coal gas, or water and oil gas, will be governed by the same limits found in these tests.

The same general problem was discussed from the standpoint of plant operation by Mr. J. A. Perry. He emphasized the importance of maintaining specific gravity and expressed a preference for the addition of either producer gas or water gas to the base-load coal gas in order to increase the specific gravity during low-load seasons. By this means it is possible subsequently during peak-load periods to add much larger percentages of carburetted water gas and still have the specific gravity variations withing reasonable limits. Mr. Perry emphasized the advantage of this procedure in making use of existing types of gas manufacturing apparatus and existing methods of plant operation.

Almost the exact opposite of this procedure was rec-

ommended by a very valuable paper presented by L. J. Willien and Louis Stein on the following day's program. In that paper, which is printed substantially in full elsewhere in this issue, these engineers reported on methods for making water gas of low specific gravity which could safely be mixed in any quantity with coal gas of the base load. The outstanding engineering achievement of these investigators is in the manufacture of such low-gravity water gas with existing equipment by methods that are readily applicable in any water-gas plant with at most minor modifications in plant machinery.

Using Water-Gas Capacity in Off-Peak Periods

Since water-gas equipment is generally recognized as the cheapest form of apparatus to install for use only in peak-load seasons, the question has naturally been raised as to what use could be made of this apparatus during off-peak periods. A special sub-committee under the chairmanship of A. C. Fieldner has considered this problem and reported in a preliminary way upon certain possibilities that had been suggested, especially the possibility of using blue-gas equipment for the manufacture of hydrogen which would subsequently be used as such industrially, for ammonia synthesis, or for methanol or hydrocarbon synthesis as in the Bergius or Fischer processes.

The first step in the committee's work was a determination of the probable capital investment for blue water-gas equipment. A variety of sources of information were consulted, from which the committee concludes that the investment cost per M per day of blue gas for chemical purposes ranges between a minimum of $75 and a maximum of $150.

Using these two estimates, S. P. Burke and F. A. Ernst calculated the possibilities of using such gas-making apparatus during off-peak periods for ammonia synthesis. The extra investment for that purpose was believed to be approximately $125 per annual ton of ammonia capacity, or from 2½ to 5 times as much as the gas-making capacity investment thus made useful during its off-peak season. It was concluded by the committee, therefore, that the water-gas equipment would have to be available for ammonia plant uses from 72 to 84 per cent. of the time or the idle investment cost on the new ammonia equipment would be greater than the saving through use of otherwise idle water-gas equipment. The general conclusion on this phase of the subject was: "From all the evidence considered, it appears that the use of off-peak gas for the production of synthetic ammonia, while possibly attractive to certain gas companies because of peculiar local conditions, is not of general interest to the gas industry."

A similar study was reported by Mr. E. R. Weaver on the extra capital investment required for converting a blue-gas plant into a hydrogen plant. These estimates indicated that the investment per M cubic feet of hydrogen made was probably six times that per M cubic feet of blue gas made. This and other factors discussed indicate that the use of idle water-gas equipment as a part of a hydrogen plant would not usually be feasible.

Combination With Bergius Process

A third study of a similar nature was made of the possibility of using off-peak water gas for methanol or hydrocarbon synthesis by such methods as the Fischer, Bergius, and like processes. A. C. Fieldner, F. A. Ernst, and R. L. Brown summarized their conclusions on this subject, as based on the best available data, as follows:

1. The investment cost per M per day of blue gas for chemical purposes ranges between a minimum of $75 and a maximum of $150.

2. The total investment, per annual ton, required for an ammonia plant of 10-tons-daily capacity is

	Minimum	*Maximum*
Gas plant	$ 26	$ 52
Ammonia plant	125	125
	$151	$177
Ratio of gas plant to ammonia plant	1 : 5	1 : 2.5

3. The total investment per annual ton, required for a methanol plant of 20-tons-daily capacity is

	Minimum	*Maximum*
Gas plant	$ 21	$ 42
Methanol plant	86	86
	$107	$128
Ratio of gas plant to methanol plant	1 : 4	1 : 2

4. On the basis of the maximum gas-plant-investment figure, the gas industry might consider the utilization of off-peak water gas for the manufacture of either ammonia or methanol, provided a market is available.

5. On the basis of the minimum gas-plant-investment figure the advantage of the gas industry over the chemical manufacturing industry disappears.

6. Other factors militating against the general production of synthetic ammonia by the gas industry are:

(a) The geographical distribution of consumers of ammonia does not coincide with that of the gas industry.

(b) Keen competition by large producers of ammonia seems certain.

(c) Production of synthetic ammonia on a very large scale by chemical manufacturers will probably lower production costs to the point that the smaller units of a gas plant will not be able to compete profitably.

7. From all the evidence considered it appears that the use of off-peak gas for the production of synthetic ammonia, while possibly attractive to certain gas companies because of peculiar local conditions, is not of general interest to the gas industry.

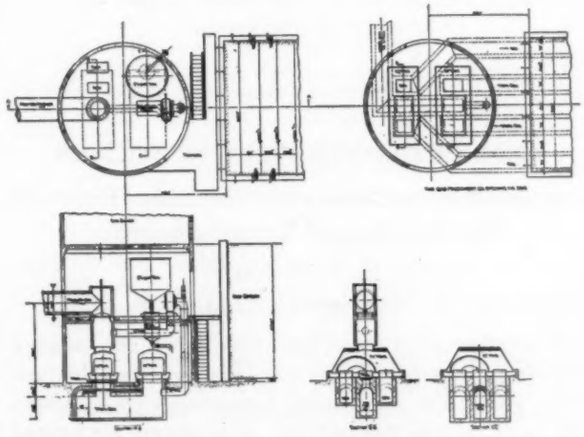
8. Market conditions for the disposal of methanol likewise appear unfavorable until such a time when gasoline shortage provides a motor fuel market.

The theoretical conclusions of the committee were confirmed, in part at least, by the discussion contributed by Professor J. T. Ward, of the Massachusetts Institute of Technology. He reported that careful experimental trial confirms the work of Fischer on low-pressure hydrocarbon synthesis. However, some trouble has been experienced with catalyst poisons and the technical feasibility of serious damage to catalysts in this manner.

CARBONIZATION OF COAL

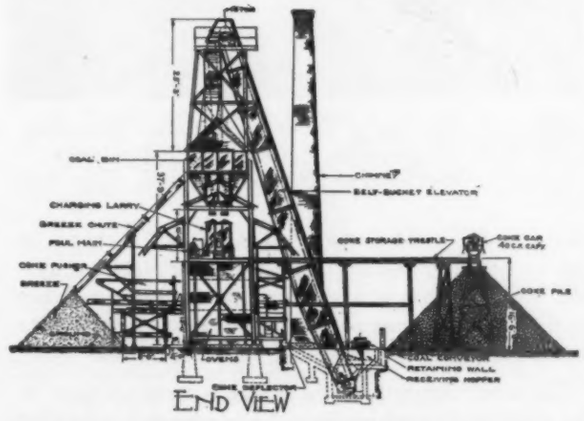
Committee Report, Plant Test Data, Producer Operation, Dry Quenching, Low-Temperature Coking, and New Plant Equipment Discussed by A. G. A. Convention

ALTHOUGH much of the energy of the Carbonization Committee members has during the past year been devoted to the engineering and economic survey of the industry, there still remained in the Carbonization Committee reports a wealth of new and valuable information. This report was presented in very brief summary at the convention by R. G. Porter, chairman of the committee. He outlined the projects considered during the year, but

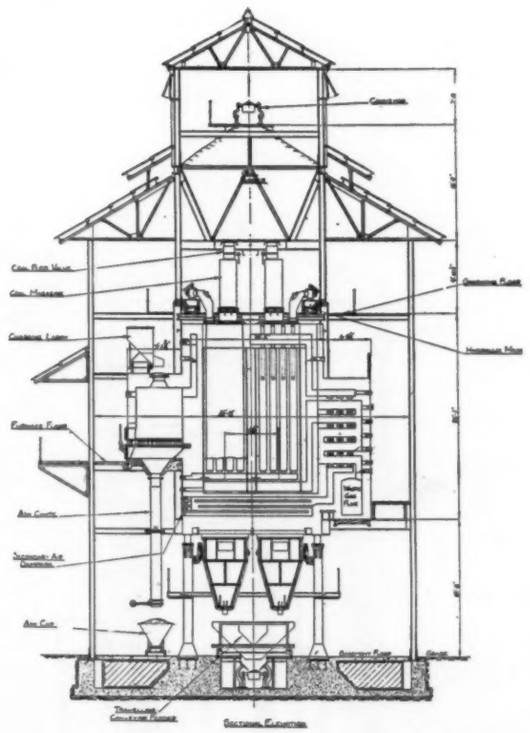


Heating-gas and flue-gas control for Gas Machinery Co. horizontal ovens.

because of the limited time available at the convention the committee was not able to present any of the engineering details. These are, however, available in full for those who desire to consult them in the form of two booklets which have been issued by the Association, the Carbonization Committee Report itself and Appendix 1 to that report, which gives the data from the Stamford, Connecticut, plant test. Only a few of the outstanding points presented by the various articles and sub-divisions of the report can be presented in these columns because of the large mass of detail which necessarily forms a part of this committee's report each year.



Improved Equipment Co. Unit Type horizontal gas oven plant.



Woodall-Duckham continuous vertical oven with gas recuperation, as built by Isbell-Porter Co.

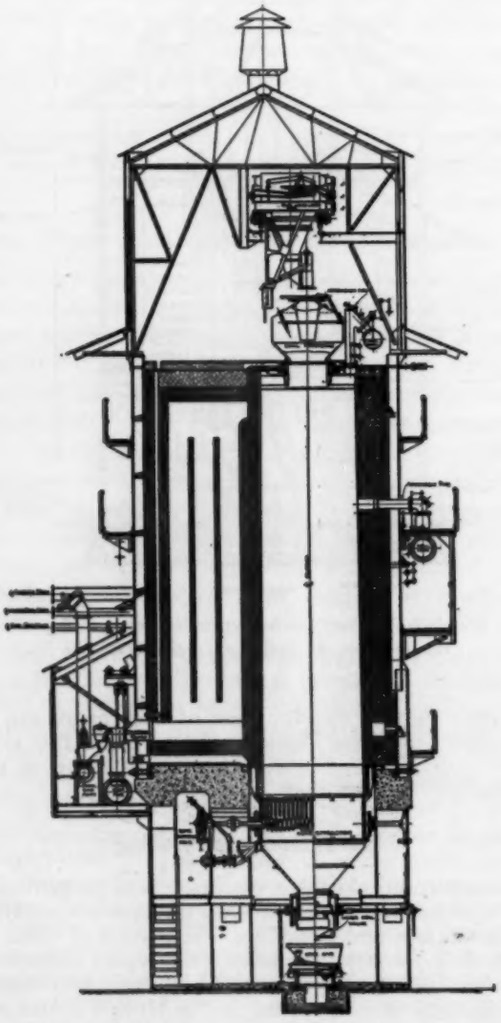
Low-Temperature Coking

A very comprehensive summary was presented in the report of the sub-committee on Low-temperature Carbonization and Complete Gasification of Coal, by Horace C. Porter, chairman. This report included a resume of the present status of all the experimental installations now operating in the United States and a reference to some of the new semi-commercial work being done by Parr at the Urbana Coking Company plant; by McEwen and Runge, at their Milwaukee installation; and with the Carbocite installation at the Philo, Ohio, station. The report also includes a resume of progress in low-temperature coking in England and in Germany.

The general summary by the sub-committee was supplemented by an article on the recent scientific research work in this field, with particular reference to the mechanism of coking, presented by J. D. Davis, of the Pittsburgh station of the Bureau of Mines Among the subjects considered by Mr. Davis are: The mechanism of coke formation; experimental carbonization of coal at low temperature; investigation of the products of low-temperature carbonization; cracking of low-temperature tar; combustibility of low-temperature coke; and synthesis of oils from water gas by the Fischer method.

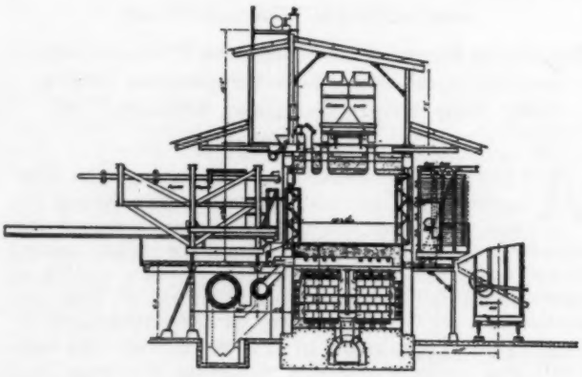
Carbonization Plant Builders' Report

The builders' section of the Carbonization Committee, under the chairmanship of F. G. Curfman, presented nine brief articles written on behalf of a corresponding number of companies, each article summarizing some of the outstanding developments of the past year made by these concerns. This summary affords, as in previous years, an excellent review of the progress which has been made in the design and erection of new coal-processing equipment and makes conveniently available to the operating engineer and executive the ideas which he must consider in the event a new carbonization installation is required.



Continuous vertical combination oven, as built by the Koppers Co.

It is impracticable to review these chapters, but a few of the illustrations presented by the committee in this section of the report are given in order to bring attention to a few, though by no means all, of the important developments or latest types of equipment available to the industry.



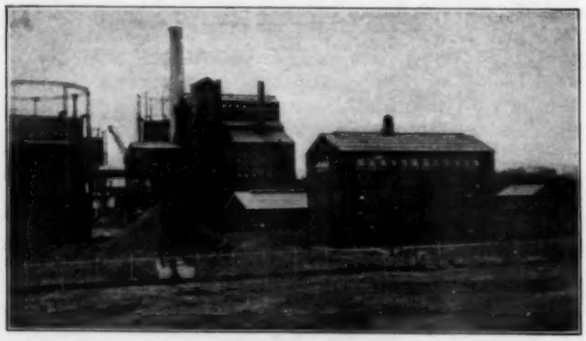
Russell Engineering Co. coal carbonizing unit with two-ton gas-fired oven.

TEST OF GLOVER-WEST VERTICALS

Heat and Material Balances on Continuous Retorts of Stamford Gas and Electric Company

By J. T. Ward
Chairman, Sub-Committee on Plant Tests

The Stamford, Connecticut, coal-gas plant consists of sixteen vertical retorts put into operation in January, 1927. The plant has a rated capacity of 1,000,000 cu. ft. of coal-gas per day. The retorts are heated by producer gas made in built-in, induced or natural draft, step-grade producers, which use nut coke as fuel. A Glover-West waste-heat boiler is used on the waste gases issuing from the retort heating system. This report is assembled in the same manner as the previous ones so that it will be convenient for those who wish to compare it with the others.



Stamford, Conn., plant of Glover-West vertical retorts, built by West Gas Improvement Co., where Carbonization Committee plant test was conducted.

The majority will probably be interested only in the final results which have been placed in the first section under "Summarized Heat Balances."

OVER-ALL HEAT BALANCE

Input	B.t.u	%
Sensible heat of producer coke including moisture	1,623	0.01
Heat of combustion of dry producer coke	3,511,475	10.93
Sensible heat of primary air including moisture	23,780	0.07
Sensible heat of producer cooling water	1,472	0.01
Sensible heat of retort coal including moisture	14,635	0.05
Heat of combustion of retort coal	28,172,000	87.72
Sensible heat of secondary and leakage air including moisture	93,375	0.29
Sensible heat of boiler feed water	12,670	0.03
Total heat of steam to retorts	285,600	0.89
Total Heat Input	32,116,630	100.00
Output		
Sensible heat of producer ash including moisture	1,247	0.00
Heat of combustion of producer ash	37,594	0.12
Sensible heat of dry retort coke	166,201	0.52
Heat of combustion of dry retort coke	17,863,831	55.62
Sensible heat of dry coal gas including H_2S	127,472	0.40
Total heat of water in coal gas	347,867	1.08
Heat of combustion of dry coal gas	7,579,000	23.60
Sensible and vaporization heat of tar	34,218	0.11
Heat of combustion of tar	2,239,920	6.97
Total heat of ammonia	33,979	0.11
Heat of combustion of hydrogen sulphide	67,200	0.21
Sensible heat of dry waste gas	580,043	1.81
Total heat of moisture in waste gas	244,152	0.76
Heat of combustion of waste gas	000	0.00
Total heat of waste heat steam	1,542,240	4.80
Total heat of waste heat boiler blow down	2,357	0.01
Total radiation and convection losses	436,800	1.36
Unmeasured heat loss	812,509	2.52
Total Heat Output	32,116,630	100.00

PRODUCER HEAT BALANCE

Input	B.t.u	%
Sensible heat of dry coke	1,375	0.04
Sensible heat of moisture in coke	248	0.01
Heat of combustion of dry coke	3,511,475	99.24
Sensible heat of dry air	4,970	0.14
Total heat of air humidity	18,810	0.53
Sensible heat of cooling water	1,472	0.04
Total Input	3,538,350	100.00
Output		
Sensible heat of dry producer gas	589,050	16.65
Total heat of producer gas humidity	142,310	4.02
Heat of combustion of dry producer gas	2,578,053	72.86
Sensible heat of dry cinder	684	0.02
Sensible heat of moisture in cinder	563	0.02
Heat of combustion of combustible in cinder	37,594	1.06
Radiation and convection loss	66,800	1.89
Unmeasured heat loss	123,296	3.48
Total Output	3,538,350	100.00

RETORT HEAT BALANCE

Input	B.t.u	%
Sensible heat of dry coal	13,500	0.05
Sensible heat of moisture in coal	1,135	0.00
Heat of combustion of dry coal	28,172,000	88.46
Sensible heat of dry producer gas	589,050	1.85
Total heat of moisture in producer gas	142,310	0.45
Heat of combustion of producer gas	2,578,053	8.08

Sensible heat of dry secondary air	18,901	0.06
Total heat of moisture in secondary air	47,800	0.15
Total heat of steam used	285,600	0.90
Total Input	31,843,349	100.00
Output		
Sensible heat of coke	166,201	0.52
Heat of combustion of coke	17,863,831	56.09
Sensible heat of purified gas	126,544	0.40
Total heat of moisture in foul gas	347,867	1.09
Heat of combustion of purified gas	7,579,000	23.80
Sensible and vaporization heat of tar	34,218	0.11
Heat of combustion of tar	2,239,920	7.03
Sensible heat of ammonia and H_2S	1,641	0.01
Heat of combustion of ammonia	33,266	0.11
Heat of combustion of hydrogen sulphide	67,200	0.21
Sensible heat of dry waste gas	1,936,075	6.08
Total heat of moisture in waste gas	325,383	1.02
Radiation and convection loss	345,200	1.08
Unmeasured heat loss*	782,003	2.45
Total Output	31,848,349	100.00

WASTE-HEAT BOILER HEAT BALANCE

Input	B.t.u	%
Sensible heat of dry waste gas	1,936,075	84.15
Total heat of moisture in waste gas	325,383	14.14
Sensible heat of feed water	12,670	0.55
Sensible heat of leakage air including moisture	26,674	1.16
Total Input	2,300,802	100.00
Output		
Sensible heat of dry water gas	580,043	25.21
Total heat of moisture in gas	244,152	10.61
Total heat of steam made	1,542,240	67.03
Total heat of blow down	2,357	0.10
Radiation and convection loss	24,800	1.08
Unaccounted for	— 92,790	— 4.03
Total Output	2,300,802	100.00

* Unmeasured heat losses include such items as coal gas leakage, dust, and scurf carbon. Some estimation of the magnitude of these is shown by the carbon balance

Heat of combustion of carbon lost = 33 × 14,544 = 479,952 B.t.u. or 1.51%.

PRODUCER-GAS SUB-COMMITTEE

Under the chairmanship of Fred Denig, the Producer-Gas Sub-Committee was organized early in 1927 to deal with problems of producer operation, fuels and fuel sizing, and producer tests. Some results of the questionnaire sent out by the committee have been summarized and are published in the full report. These data afford a splendid basis for operating engineers to use in comparing their own operating results with those obtained in other plants.

The work of the sub-committee also dealt with the proposed revision of the producer test code being formulated by the A. S. M. E. committee. That project is still in tentative form, but it is anticipated that the joint work of the two associations will result in the adoption of a mutually satisfactory code for promulgation during the coming winter.

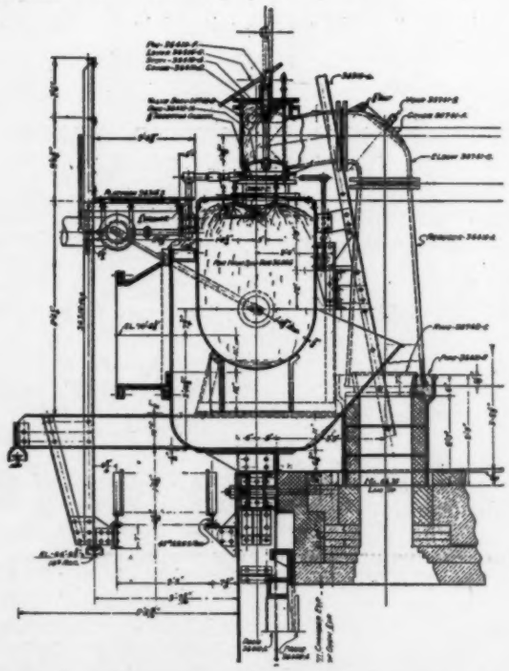
The work of this sub-committee was supplemented by a carefully prepared paper written by Mr. Fred Denig, who discussed many of the features of coke-fired gas-producer operation, particularly as practiced in the gas and coke works. In view of the importance of utilizing fine coke in the producer at such works special attention was given to this problem. Comparisons were made between the ring-feed and the center-feed types of machines, especially in their influence upon the shape of the fuel bed and on the percentage of carbon in the producer ash discharge. This particular feature of Mr. Denig's paper gave rise to considerable discussion during convention sessions and there still is remaining a

striking difference of opinion as to the intrinsic advantage of these two types of feeds.

B.t.u. CONTROL OF COAL GAS

A sub-committee on the subject of B.t.u. control of coal gas was organized under the chairmanship of F. D. Lohr. This committee undertook to investigate the present practice throughout the country by means of a questionnaire which went out to a large number of companies. Among the questions asked were: What means are used to reduce the heating value of the coal gas from the value as made to the value as distributed; why is this means used; what regulation of inerts or flame characteristics affect this decision; and, finally, what heating value is distributed? The findings of the survey are summarized by the committee in the following language:

1. When a base load gas is being considered, the favored means for controlling was by mixing in producer gas. Most coke oven operations are in this group. At some plants very elaborate means are taken to insure absolutely uniform B.t.u. in the send-out.



Collecting-main liquor sprays, as recommended by Semet-Solvay Engineering Corp. to minimize pitch trouble in mains and valves

2. Where the B.t.u. control is tied up with a question of peak load production, the common method is by mixing with water gas, varying the B.t.u. of the control gas, in order to govern the size of the send-out.

3. Verticals, as a rule, depend upon steaming for the B.t.u. control, though in some instances the varying pressure on the retorts is also an additional means used.

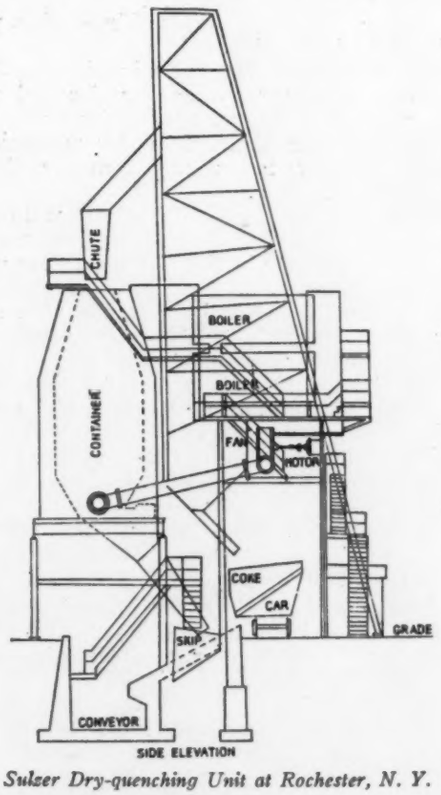
4. With the B.t.u. range, in which the operator works today, the practice of inerts, specific gravity, etc., while important, are not the ones that govern in the problem of B.t.u. control. However, as the B.t.u. standards are made lower, these factors loom up larger and become increasingly vital.

The operator must study the problem of B.t.u. control from every angle—practical, laboratory and theoretical—in order to work out the best solution of this, one phase of the general problem of the most economic production of gas..

DRY QUENCHING OF COKE

Sub-Committee Report by J. S. Haug, Chairman

The conservation of heat in connection with the coal carbonizing process has been recognized for many years as a subject of great importance. Engineers are generally prepared to give their close attention to any means of reducing the heat required for underfiring, or to recover it when it otherwise might be wasted.



Sulzer Dry-quenching Unit at Rochester, N. Y.

The sensible heat of the glowing coke discharged from ovens or retorts has, however, been generally wasted until recent years. Now that dry quenching has become established it seems remarkable that it should have been so long neglected, especially when the magnitude of the possible saving is considered. A recent investigator states that the amount of heat remaining in the coke when discharged represents

25 per cent. of the heat required for underfiring in carbonization.

A large portion of this heat is now being recovered in dry quenching installations, particularly in Europe where the process was first developed. There the original installation was followed by a number of others, using various methods and apparatus. In America, the development has been along conservative lines, and to date two plants have been put into operation, the Sulzer plant at Rochester and the U. G. I. plant at Syracuse.

BENEFITS OF DRY QUENCHING

Among the general advantages of dry quenching presented by the committee are the following:

1. The dry quencher appears to be an economic success where the steam can be used, where credit for steam alone is taken.
2. There are a large number of intangible, yet real, credits difficult to value.
3. The dry quenching operation breaks the coke up so that it averages a smaller size and contains more breeze than the wet quenched coke.
4. The fundamental structure of dry quenched coke does not appear to be any stronger than wet quenched coke.
5. Where it is necessary to crush the wet quenched coke to meet a market, the coke crusher operation is saved and breeze production somewhat less with dry quenching.

The intangible and indirect credits referred to in the second of these conclusions are also presented in the committee report as follows:

1. Elimination of steam and vapors of wet quenching. This is important in a residential and office district.
2. Reduction of corrosion maintenance and painting expense, due to elimination of wet quenching vapors.
3. Reduction in maintenance and prolonging life of hot coke car equipment.
4. Better plant housekeeping conditions.
5. Breakage of coke in quencher, saving power and maintenance on coke crusher.
6. Better results in apparatus using dry quencher coke, such as water gas machines and producers due to using dry fuel.
7. Reduction in maintenance and operating difficulties of coke conveyors, especially in winter, since accumulations of ice and frozen breeze on conveying equipment are prevalent with wet quenching and absent with dry quenching.
8. Direct saving of water for quenching.
9. Carbonization in quencher of any portions of the charge not completely carbonized, giving a uniform quality and color instead of the black dirty appearance found in wet quenched coke.
10. Better separation in screening plant due to dryness.

The U. G. I. type of quencher at Syracuse is described and operating results given from a ten-day continuous test, as follows:

Capacity (tons of coke cooled per day)	101.67
Steam generated (from and at 212° F.) (lbs. per 1000 lbs. coke)	249.2
Steam pressure (lbs. per sq.in.)	119
Feed water temperature (°F.)	46°
Temperature of coke as charged (°F.)	1700°
Temperature of coke as discharged (°F.)	665°*
Average boiler horsepower developed	65.8
Tons coke cooled per hour	4.54
Horsepower developed per ton coke per hour	14.5

* (The pyrometer had a sheath so probably temperature of coke discharged was less.)

European experience with the various systems of dry quenching is also summarized by the committee and European conclusion as to the direct advantages of dry quenching repeated as follows:

1. Higher calorific value of the coke.
2. Smaller percentage of breeze.
3. Saving of quenching water.
4. Production of steam.

A discussion of the economic advantages of such plant is also presented in the form of an estimate as to the earnings which could be credited to such new unit, costing perhaps $250,000, capable of dry quenching 155,000 tons of coke per year. On the basis assumed the plant would pay returns of 38 per cent., and hence "would pay for itself in less than three years."

THE GAS AND COKE MAKING PROPERTIES OF AMERICAN COALS

Report of a Sub-Committee of the Carbonization Committee to Determine Feasibility of a Survey,

J. S. Haug, Chairman

"Any chemical engineering industry must have the fullest possible knowledge of the source, quality and behavior of its raw materials. The manufactured-gas industry does not yet have such knowledge regarding its major raw material, bituminous coal. It has been deemed important, therefore, that a fundamental and comprehensive investigation be made to survey the character and the behavior of gas-making and coking coals and to establish procedures for testing which will be significant as to the behavior of such coals in a commercial carbonizing plant.

"The Carbonization Committee of the American Gas Association considered this subject of sufficient importance to appoint a special sub-committee to inquire further into the advisibility of and the proper means for procedure in such investigation. A large volume of research work has been carried out on American coals, and information is available both from the Bureau of Mines and the U. S. Geological Survey, bearing on the results of different coals for firing boilers and other applications. The field of coal carbonization with information on yields of gas, coke, and by-products has, however, been left virtually untouched, except here and there by private investigation.

"When one considers that 500,000,000 tons of bituminous coal are mined per year, worth conservatively one billion dollars, of which upwards of 20 per cent. are processed, with the tonnage constantly in-

creasing, little more need be said to stress the economic importance of a widespread knowledge of the behavior of such coals in processing. It is evident that such an investigation is definitely in line with the program of the American Gas Association adopted by the Executive Board, May 21, 1926, which reads in part: 'That technical research in all fields affecting the gas industry be intensively promoted.'

"The major questions considered by this sub-committee were, therefore, the following:

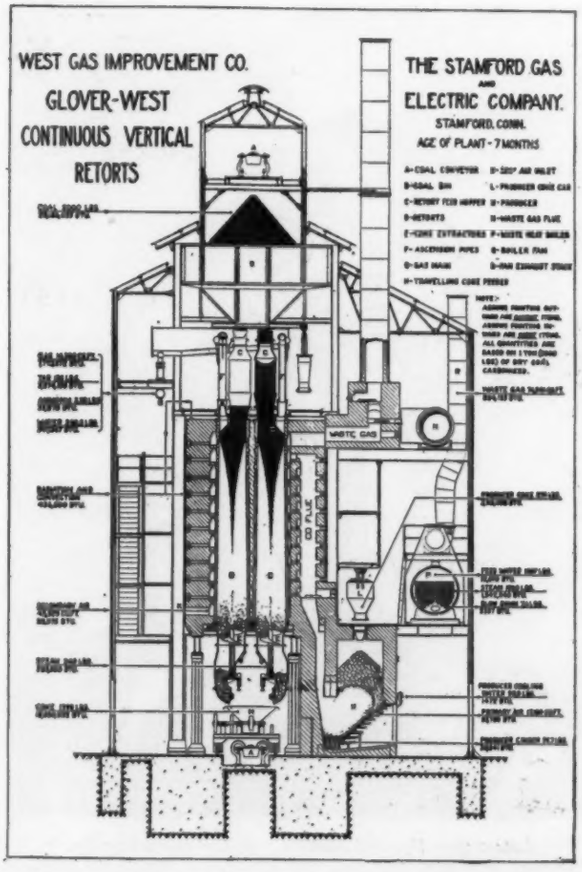
1. Could valuable practical results be obtained from moderate-scale or laboratory-scale testing of coals?
2. What means could be used for a preliminary study of such procedures as are deemed promising?
3. What would be the cost of such comprehensive investigation as will necessarily follow this preliminary work?
4. Under what auspices can this comprehensive work best be done?

"The sub-committe considering this subject is unanimous in its opinion that extremely valuable results will inevitably be obtained from such an investigation. Considerable work has been done by foreign investigators on foreign coals, with different types of apparatus and with different methods of approaching the problems involved. It would seem logical, therefore, to undertake preliminary work, with a view to determining what is the present status of our knowledge, from both American and foreign sources, of small-scale testing procedures using samples from a few grains up to a few hundred pounds of coal per charge, correlating the different methods where possible. Such an investigation would certainly augment the industry's knowledge of the behavior of coals during carbonization, and this would alone warrant the necessary expenditure.

"As a result of such preliminary inquiry it is believed that a very definite program of further investigation can be adopted and such program can be carried out expeditiously and economically beginning as soon thereafter as funds become available.

"The committee believes that the Association and interested Government laboratories should co-operate actively in the preliminary work. It is evident, however, that the funds required for the more comprehensive investigation to be made later will almost certainly have to come through appropriations by Congress for use of the technical bureaus of the Government under whose immediate charge the work of experimental investigation will presumably be carried out. Such arrangement to carry out the work in the laboratories of the U. S. Bureau of Mines, would greatly reduce the cost of the investigations, because the bureau has already available much of the needed equipment, many of the needed directors of the work, and it could furnish much of the needed auxiliary service at very much less cost than could any independent new laboratory.

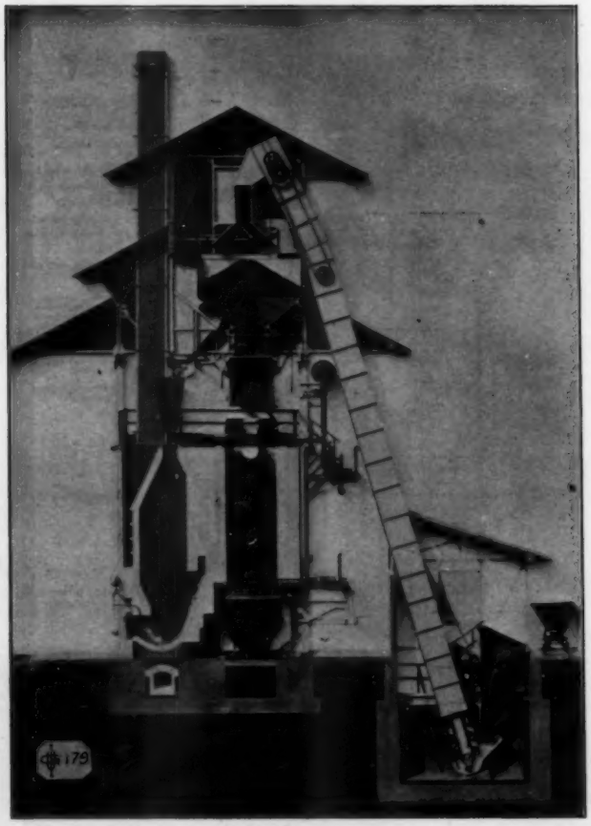
"An inquiry addressed to the director of the Bureau of Mines brought the reply that the bureau would be glad to undertake such an investigation whenever funds are available. On account of the magnitude of the project a special appropriation would be required.



"It is believed that an adequate appropriation could be obtained through action of the American Gas Association in co-operation with other interested parties in bringing the need and importance of this work to the attention of the Secretary of Commerce and the Director of the Budget. The sub-committee believe that the co-operation of the National Coal Association in this work is logical and desirable and has reason to believe that such co-operation can be obtained.

"The sub-committee believe that the gas industry is justified in requesting this survey to be made by the national government, because of its fundamental importance in conserving the fuel resources of the nation through more efficient utilization of the various types of coal. The results of such an investigation by a disinterested and authoritative body would be of value not only to the gas industry but to other fuel using industries and the coal industry as well. To cover the cost of the preliminary work, funds will be required, and this sub-committee has formulated the following recommendation, as from the Carbonization Committee to the Managing Committee of the Technical Section:

"That the Managing Committee of the Technical Section recommend to the Board of Directors of the American Gas Association, that the Carbonization Committee be authorized to expend the sum of $5,000 in preliminary work in co-operation with the U. S. Bureau of Mines, to determine what is the status of our present knowledge of laboratory and small-scale



Latest type Vertical oven. U. G. I. Contracting Co.

testing methods and to the end that the larger work of the survey of the gas and coke making properties of American coals may be expeditiously and efficiently carried out as soon as Government appropriations become available."

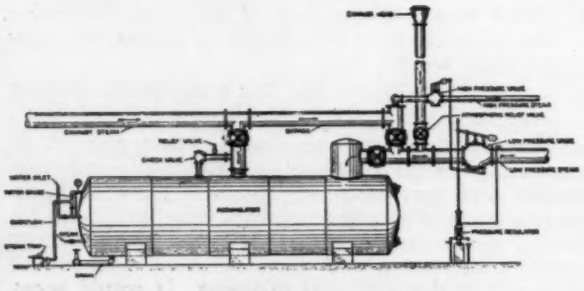
WATER-GAS COMMITTEE

Summary of Reports and Papers Presented as Reviewed for the Committee by J. H. Wolfe

During the past year the Water-Gas Committee of the Association was organized under the chairmanship of Henry Fink, of Detroit, with W. J. Murdock as chairman of the operators' section, C. J. O'Donnell chairman of the builders' section, and H. C. Adams chairman of the uncarburetted water-gas section. In order to give as concise and yet comprehensive report as possible of the numerous activities of the Water-gas Committee, Mr. John H. Wolfe was asked to prepare a paper based upon the committee work and this was presented before the technical section in lieu of the reading of the committee and subcommittee reports themselves. Some of the more important sections of the report as presented by Mr. Wolfe are given below.

Uniform Oil Efficiency

The committee on uniform oil efficiency has been working on this very difficult problem for several years in an endeavor to bring order out of chaos. When considering the magnitude of the problem, I must say that they have succeeded remarkably well. In last year's report, the committee advocated the use of a modified method which was based on the procedure used in determining the efficiency of the utilization of oil in oil gas sets on the Pacific Coast. The modified method was elaborated to cover usage, first on straight water gas operation with coke or anthracite coal; second, on straight water gas made from bituminous coal; and, third, on water gas made from bituminous coal when using the blow run.



Gas Machinery Co. exhaust steam accumulator.

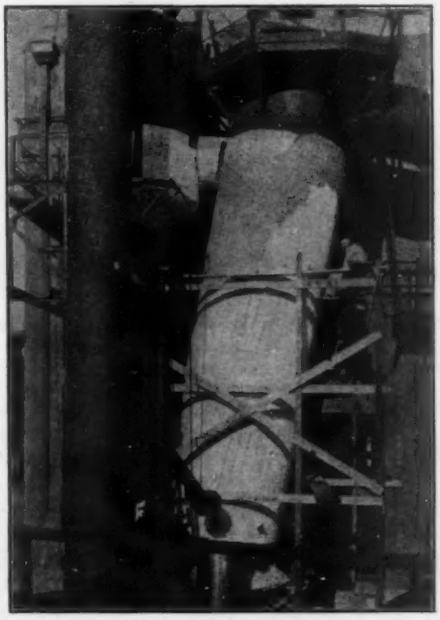
"In reviewing the application of these methods by the various member companies, it was found that the method for straight water gas from coke or anthracite was a workable scheme. The two latter, however, were not applicable because of the limited information obtainable regarding the relative volume of coal gas, blue gas, oil gas, and blow-run gas in this mixture. It is comparatively easy to solve an equation containing only two unknowns. It becomes increasingly difficult, however, to render a solution as the number of unknowns increases. I can say from personal experience over a period of ten months, that the method outlined by this committee has furnished me with information which has been valuable in operating my plant.

"I am sure that many of you would be surprised, and shocked as well, to realize how far the blue gas which you make comes from being near the "sacred" 290 to 310 B.t.u. which it has always been assumed to be. Likewise, many a gas oil which has been in bad repute with you because it did not appear to give good oil results, will receive its just dues. In my own case, I found that our blue gas at the start was but 265 B.t.u. on a monthly average. However, we have raised this monthly average to 284 for the month of September, 1927. This is still 6 B.t.u. under the 290 which we had always used in computing our oil efficiencies. The objections which some have raised as to the difficulty of securing accurate gas analyses and representative gas samples are, when considered carefully, no more valid than the objections which we might raise concerning the difficulty of accurately metering our gas or determining its heating value. I bespeak for the committee a serious review of its work by all of you, and recommend that you, as individuals, attempt to make application of this method.

It may not be perfect, but it is a big improvement on the old methods which were in use prior to its adoption.

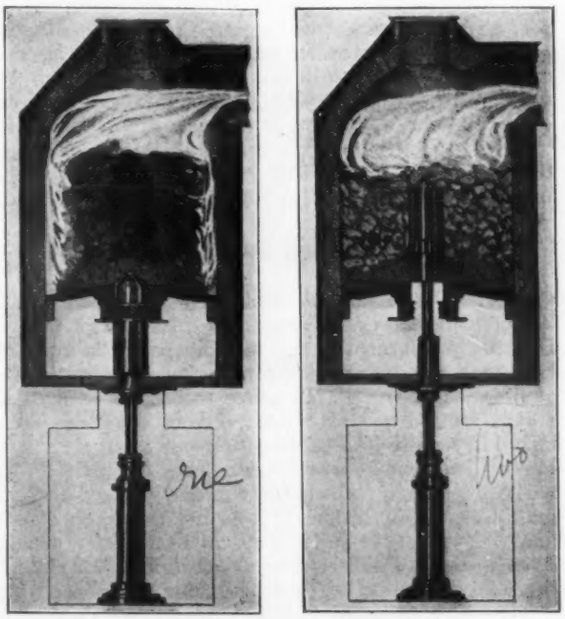
Power and Auxiliary Equipment

"In the report of the Committee on Steam and Power Engineering Practice in Gas Works, some excellent ideas are presented. The report calls attention to several labor and material savers which have proved their worth in the industry. I am referring particularly to the waste heat boiler, of which there are several reliable makes on the market, and the waste steam accumulator. Both of these save money if a careful study is made so as to secure the most satisfactory application and maximum benefits therefrom. The use of the accumulator, particularly, will force the operator's attention on the efficiency of his steam consuming equipment, and may indicate to him the desirability of substituting electric drive for some of his steam driven equipment. It is hardly necessary to emphasize the fact that low pressure or exhaust steam is eminently satisfactory for the manufacture of water gas, or that the use of the back-run or Chrisman cycle does not vitiate the need for waste heat boilers. Some interesting curves, which are worthy of close scrutiny, are included with this committee's report.



U. G. I. Contracting Co. vertical waste heat boiler at Tampa, Fla.

"The discussion on boiler room apparatus contains some interesting and valuable information which it is desirable for us all to review occasionally. I differ with Mr. Cheney in his statement that it is a good policy to install boilers in batteries, as I believe that boilers in single setting are more desirable, considering the ease of operation and repair, than the battery arrangement. I heartily agree with him, however, in his suggestion for reserve boiler capacity, as the steam boiler is to the gas plant what the heart is to the human body. Thus, when the boilers or boiler



Semet-Solvay grate poker for water-gas machine. Fig. 1 shows poker out of use; Fig. 2 poker in use.

auxiliaries go down, the gas plant shuts down perforce. His suggestion regarding the advisability of installing high settings under the boilers is most timely, as usually boilers are set entirely too low to secure the maximum furnace efficiency, particularly when burning bituminous coals or tars and especially at the higher ratings.

Exhausting - Pumping

"The division covering exhausters, boosters and compressors is also a valuable contribution, in that it reviews some cardinal principles of application of steam or electricity to such equipment. Mr. Genay's references to the ease of regulating the speed, reduced fire hazard, and general reliability of steam-driven equipment, are particularly important. Personally, I do not believe that it is wise to tie up and render vulnerable the continuity of one vital service, such as the supplying of gas to the city with an equal vital one such as the supplying of electricity to that same city. I would like to add to Mr. Genay's description of boosters and compressors, that centrifugal units can be made to deliver gas up to five pounds pressure in single stage units and higher in multistage units. The question of applying this type of unit as against reciprocating compressors is largely a matter of the volumes to be handled rather than the pressures, except when the pressures are very high.

"The section on pumps and miscellaneous steam apparatus outlines some fundamental facts which the operator should consider when about to purchase equipment in this classification. A point worthy of note in connection with the steam separator is the

necessity for ascertaining the efficiency of moisture removal at various steam velocities, and of installing separators which are installed to remove moisture from steam do not efficiently fulfill their purpose, but serve to add back pressure to the line feeding the equipment they are supposed to protect. In most cases, properly installed condensation or drip legs will perform the function of a separator at a lower cost and with a reduction in back pressure. I wish to reinforce Mr. Caputi's recommendation regarding the necessity of installing steam flow meters. They will 'pay their way' in almost every instance.

The Exhaust Steam Problem

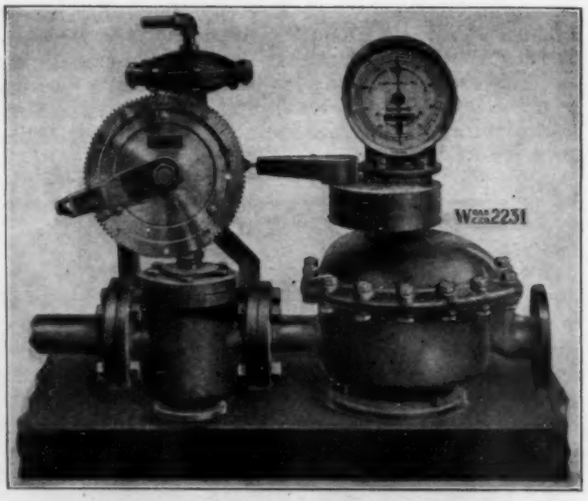
"Mr. E. L. Hall has contributed a paper entitled 'Electric Drive vs. Steam Drive in a Large Oil Gas Plant.' My interpretation of this paper is that Mr. Hall really has a combination steam and electric plant at his oil gas works. In other words, he utilizes the steam from his waste heat boilers plus the steam raised in the oil fired boilers for generating electricity. He utilizes this current in motors for driving the various pieces of equipment around the plant. In making his calculations it appears, however, that he uses high pressure and not exhaust steam for process. A considerably different answer might be obtained if the exhaust steam were utilized for the process and a fair value assigned to this steam when computing the savings of each division.

"Given an average boiler fuel cost, fair efficiency in steam generation, and steam from waste heat boilers, the use of exhaust steam through an accumulator for process will generally throw the economic balance in favor of steam-driven equipment, because in this case the power is obtained as a by-product. There is, however, an economic limit and a careful survey should be made in an endeavor to give electric drives the consideration which they deserve. As regards the advantages which Mr. Hall enumerates, I disagree with Item No. 6, in which he states that it is easier to regulate motor driven equipment. With direct current motors, the odds are about even, but with alternating current motors, the balance is greatly in favor of steam-driven units when it comes to the accuracy and ease of speed regulation.

Automatic Machines

"The next important subdivision is that on automatic charging and clinkering machines, by Mr. H. B. Young, chairman. The report covers the experience obtained over nearly two years of operation of an A. B. C. grate at Chicago, and a short report on automatic charging machines. Although an A. B. C. grate and charger were installed at Detroit this spring, they have not been run due to the fact that the plant has been shut down. Two other A. B. C. grates have just been put into operation at Minneapolis. We installed an A. B. C. grate at Baltimore and put the same into operation on September 27, 1927. To date it has run continuously for many hours, without any manual clinkering. Although it is too early to state definitely the savings obtained by running this machine, the results are very promising. This set is also being equipped with a Howard automatic charger.

"On one of our other sets we have installed a Steere automatic charger which has functioned satisfacorily to date. The design of both makes of chargers has been changed from the initial or high forms to new low forms to permit of their being installed in the reduced head room which we had available. A new piece of automatic clinkering equipment has recently been announced by another company. I understand that one of these rolling grates, as they are called, has been installed to operate in conjunction with a grate poker and automatic charger, both manufactured by the same company, on a set in Pontiac Michigan. This grate has only been operated about a month, and operates successfully when removing bottom clinker. It is our intention to install one of these rolling grates and pokers on the same machine with the Steere charger. This will give us two completely equipped automatic water gas sets from which we should be able to secure much valuable information.



Western Gas Construction Co. automatic self-measuring meter. Automatically controls oil feed.

"Prior to installing this equipment we made a careful investigation and all of the information which we were able to obtain indicated the fact that the use of automatic charging and clinkering equipment is highly desirable. The present high first cost of some of this equipment may cause some to hesitate, but it is believed that as more are sold, that prices can be reduced to make them more attractive. Automatic devices should certainly be tried out by the industry and the manufacturers encouraged to further refine and develop such equipment, because the ultimate result will be a smoothness in operation and a reduction in labor and material costs that cannot but advance our industry.

"The paper by Mr. Genay on the operation of a mechanical generator is an interesting one. He calls attention to the fact that the equipment manufacturers are anxious to develop apparatus to advance the state of the art of water-gas manufacture. He also states that the results already obtained give promise of commercial success rather than being only in the nature of experiments on a large scale.

Tar Emulsions

"The report of the Committee on Water Gas Tar Emulsions, Their Prevention, Treatment and Utilization is a most interesting analysis of the operating conditions reported by a great number of companies was made by Mr. H. K. Seeley, chairman. I desire particularly to call attention to his recommendations for the prevention of emulsion. A carefuly study of these cannot fail to be of marked assistance. Particularly, the question of adequate separator capacity and poper arrangement of separators should be stressed. I believe that a careful study of this point would reveal the fact that most of us are operating below the sizes recommended by the last committee on waste disposal which submitted such excellent reports several years ago.

"A point which is not brought out in this report, but which is very important, is that it is absolutely necessary to keep the separator water temperatures up to at least 150° F. if good separation is desired. The tar and water mixtures should not be chilled or cooled until the water has left the tar. As regards a means of treatment, I know from experience that the cost of separating large volumes of emulsion is much lower when using a distillation method than when using a centrifugal or so-called mechánical method. The cost of labor and repairs when using the centrifugal method is always high. In small plants, it may, however, prove to be a satisfactory solution of the emulsion problem.

Practical Evaluation of Gas Oil

"The papers on "Gas Oil Efficiency and Efficiency Computations," by Mr. H. Vittinghoff, and on "Analysis of Gas Oils for Series of Hydrocarbons," by Dr. T. A. Mighill, throw light on a problem which has long baffled the water gas industry. The method of attack is novel in that it attempts to determine the probable efficiency of a gas oil as a carburetting agent by analyzing the oil and dividing it into four series, namely, paraffins, olefines or unsaturates, naphthenes and aromatics. By assigning certain assumed carburetting efficiency values to each class, the total efficiency of the oil is predicted. The comparisons which are drawn between the efficiency calculated on this basis and tests in a cracking furnace seem to indicate remarkable concordance. Whether these close comparisons are obtainable under all conditions is to be equestioned; one of the basic questions being the accuracy of the cracking furnace for determining cracking efficiency as compared with results obtained in actual practice. Most certainly the present method of distilling an oil in the laboratory to determine the volume of fractions boiling at certain temperatures is of practically no use in predicting its value as a carburent. Before this new method can be standardized, however, certain fundamental things must be determined as follows:

"1. A method must be evolved for determining each of the four classes of compounds which will give accurate and consistent results in the hands of all chemists. The methods outlined in the paper do not check with other methods in use, nor do check determinations on the same sample with the methods outlined give close results.

"2. The efficiency values of each class of compounds must be definitely determined by some means and not assumed values used. The assumption of 100 per cent. conversion efficiency for the paraffins seems to me to be rather higher than one would expect in practice.

"3. No assumption should be made of the heating value of the blue gas but the determination actually made. I know from experience that it is impossible to assign definite values since operating conditions change too much from day to day to maintain the standard results.

"4. A definite method for determining the cubic feet of oil gas per gallon of oil should be drawn up so as not to place reliance on a formula which is based on Beaume gravity.

New Equipment

"In the report of the builders' section, the Gas Machinery Company report the perfection of a steam curtain, double gate, hot gas valve for use between the superheater and the waste heat boiler. They also call attention to the desirability of installing breeze dust collectors on the superheater stacks and exhaust steam accumulators for conserving steam for use in water gas sets.

"The U. G. I. Contracting Company present to the industry installations of new equipment at Tampa, Fla., and New London, Conn., and describe the salient features of these new plants. They also stress the use of exhaust steam accumulators and the Cottrell electric tar precipitating system. A mechanical generator is described, the operation of which is covered under the operators' section in a paper by Mr. T. B. Genay.

"The Semet Solvay Engineering Corporation gives a very complete description of the grate poker for use on water gas machines. This power is reported as keeping the generator fire in a much more uniform condition from clean to clean, and will assure better operating results particularly when using bituminous coal.

"The Western Gas Construction Company have developed an automatic self measuring oil meter. Although this equipment was designed for use on the Koppers type naphthalene scrubber, its use is advocated for the measurement of oil to water gas sets. A description of the A. B. C. self-clinkering generator grate with recent improvements is also included. The operation of this grate is covered under the operators' section, by Mr. H. B. Young's report on the results obtained at Chicago.

"In conclusion I wish to state that the water gas industry, during the past year has made rapid progress toward more efficient operation by utilizing new equipment recently placed on the market, and has consolidated the gains made during the past few years by installing additional equipment, which, while not quite so new and novel at present, has demonstrated its practicability and efficiency. I look for still greater things ahead, and know that as all minds in the industry focus their attention on the problems of our manufacturing process, improvements in equipment and methods are bound to result.

Low-Gravity Water Gas

One of the outstanding papers on water gas was that previously referred to by Willien and Stein. That paper, presented elsewhere in this issue, stimulated considerable discussion on the convention floor and particularly it aroused very interesting comment from Mr. R. A. Carter, Jr., of the Consolidated Gas Company, New York, and Mr. C. H. Waring. Both of these gentlemen had undertaken to make low-gravity water gas by somewhat similar methods, using oil during the back-run period of the cycle.

Mr. Carter stated that he obtained about 25 per cent. increase in capacity from the set, used five to six pounds less solid fuel, but nearly one gallon more oil per M, and made a gas of about 0.57 specific gravity. Mr. Carter also emphasized that it was very desirable to reduce the specific gravity during the winter period as low as possible in order to reduce the power required and increase the transmission main capacity in pumping. Mr. Carter also recommended use of a high specific gravity gas, using a purge and blow-run in order that this product, of 0.83 specific gravity, could be used during the Summer for mixing with the coal gas, thus raising the minimum specific gravity of the mixture during low-load seasons. Under this system of operation he reported 30 per cent increase in capacity with about the same fuel consumption as was recorded for the period when using oil in the back-run.

Mr. Waring's discussion related to work done a considerable number of years ago in Omaha in the making of low specific gravity gas for balloon purposes. He did not, however, operate at that time with exactly the procedure recommended by Willien and Stein, as in general he was using tar during a down-run period, rather than oil. His observation at that time was that for each pound of tar thus added one pound of generator fuel was saved, assuming the same quality and make of gas.

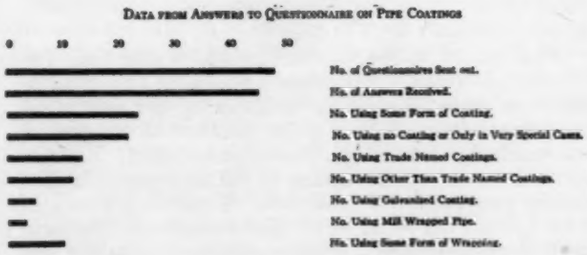
DISTRIBUTION COMMITTEE REPORTS

The Distribution Committee of the Association reported through its chairman, C. C. Simpson, and by a sub-committee report on pipe joints presented by J. D. von Maur. The general committee report included the work of other sub-committees on pipe coatings, pipe materials, power machinery in distribution, meters, and the definition of "high-pressure" distribution.

The sub-committee on pipe coatings presented a discussion of the information gathered by a questionnaire. A graphical presentation of the information received by this means is shown below, indicating the extent of interest in this subject among the 48 large companies consulted. There developed from the work of the sub-committee the following summary which it recommends as the definition of the characteristics of a good pipe coating:

(a) The coating material should be impervious to air and moisture.

(b) It should adhere tenaciously to the surface of the pipe.


Data from Answers to Questionnaire on Pipe Coatings
0
10
20
30
40
50
No. of Questionnaires Sent out.
No. of Answers Received.
No. Using Some Form of Coating.
No. Using no Coating or Only in Very Special Cases.
No. Using Trade Named Coatings.
No. Using Other Than Trade Named Coatings.
No. Using Galvanized Coating.
No. Using Mill Wrapped Pipe.
No. Using Some Form of Wrapping.

(c) It should not be brittle at 0 degrees Centigrade (32 degrees Fahrenheit) or soften to such an extent at 60 degrees Centigrade (140 degrees Fahrenheit) that it will run or rub off during handling.

(d) It should withstand, without chipping or spalling off, the shocks and abrasion to which the pipe is likely to be subject without transportation and installation.

(e) The coated pipe should not stick together during transportation.

(f) The material should be easily applied either in the yard or in the field.

(g) The material should be of such a character that any damage occurring in the field can be readily repaired after installation.

Definition of "High Pressure"

A sub-committee which has been undertaking to prepare a workable definition for the term "high-pressure distribution," formulated its conclusions in three definitions which set limits between what are customarily considered low-pressure, medium-pressure and high-pressure systems. They set the limits at approximately 20 inches of water for the border between low pressure and medium pressure; and 15 lbs. per sq. in. as the limit between pressure and high pressure, as ordinarily understood.

Much of the material presented in the balance of the committee report was an elaboration or formal recording of results discussed at the distribution conference of the Association in Baltimore last Spring. It is, therefore, not necessary to review it further here, except in the case of the sub-committee report on pipe joints, which aroused most of the discussion at the meeting where the distribution committee work was considered.

Pipe Joint Recommendations

Details of difficulties experienced and means for avoiding such difficulties were presented by the committee with reference to lead, cement, lead-wool, Dresser-coupling, welded and screw joints, and an effort was made by the committee to determine the extent of leakage which is commonly experienced by gas companies with these various types of joints. The table summarizing the experience so reported is reproduced herewith, covering the results of work in companies having between 20,000 and 25,000 miles of main.

As a result of this study the committee drafted a set of recommendations applicable to the types of joints most widely used in the industry. Their recommendations are as follows:

1. That greater care be exercised to ensure that

TABLE SHOWING LEAKING JOINTS REPORTED DURING 1926, BY COMPANIES REPRESENTING BETWEEN 20,000 AND 25,000 MILES OF MAINS

Type of Joint	Pressure	Size of Pipe															Total
		1¼"	2"	3"	4"	6"	8"	10"	12"	16"	18"	20"	24"	30"	36"	42"	
Lead	Low			311	4974	3756	1592	381	844	520	2	398	343	23	2		13146
	Medium high				6	29	40		139	149		605	246	74	154	109	1551
Cement	Low			7	106	965	554	72	508	181		9		16	19		2437
	Medium high				6	5	17	4	18	33		74	30	11			198
Lead wool	Low				19	86	64	1	62	2		8					242
	Medium high				8	16			33	121		92	2		108		380
Welded	Medium high				1				1								2
Screw	High	1	1	1													3
Flange	High					2											2
Long screw	High		5														5
Dresser	High	7	4		7	2	1										21
	Medium high					1			17				5				23
Total		8	10	319	5127	4862	2268	458	1622	1006	2	1186	626	124	283	109	18010

each length of pipe rests on a firm foundation and, as far as possible, on the undisturbed bottom of the trench. All blocks should be counter-sunk so that the top of the block will be flush with the bottom of the trench.

2. That regardless of the type of joint used, every effort should be made to perform the necessary operations of making the joint in the most thorough and workmanlike manner and to use the best of materials for the purpose intended.

3. That the lead groove be maintained for all pipe provided with standard bells until satisfactory proof is furnished that it may safely be omitted.

4. That where lead is used for caulking, the distance from the face of the bell to the front edge of the lead groove be increased to at least 1 inch; that the front edge of the bell be made as smooth as possible; and the space inside of the bell from the face to at least 1 inch back of the lead groove be made smooth and free from dirt. (See 11.)

5. The depth of 16-inch and 20-inch bells should be, at least, 5 inches if standard bells are used with lead, cement or combination joints.

6. That on all large sized joints, a light sledge hammer be used, when caulking, in order to more thoroughly compress the lead.

7. Where cast-iron bell and spigot joints 20 inches and over are called upon to withstand a pressure of from 2 to 15 pounds, that a deep bell (6 inches) with a combination lead and cement joint be used. The lead may be either cast or used as lead wool and caulked either by hand or air hammer. Lead wool appears to give the best results, when the work has been done properly. If extra care is used and all precautions taken the all-cement, B bell joint will give good results.

8. Regardless of the type of joint used, it is advisable to use a leak clamp on joints under complicated street intersections, in very deep trenches, or where conditions are such that repairs would be difficult, dangerous, or expensive (H.P. in large size mains.)

9. More companies should try out a reasonable amount of such new types of pipe and pipe joints as appear to possess special merit. To avoid duplication of work, experiments should be made in accordance with some well-thought-out and organized plan, and not in a haphazard manner.

10. Each company should begin at once to compile a complete history of every leaking joint and broken main which takes place in its system. This information should be carefully tabulated monthly and a final summary sent to the permanent Distribution Committee on forms specially prepared for the purpose. This report should be in the hands of the committee by a specified date, preferably February 1st, and should include all information up to the end of the calendar year.

11. That the design of the lead groove bead and the proper depth of bell be given careful study. The design of grooves shown in Fig. 2 would seem to retain all the advantages of the standard bell without its disadvantages.

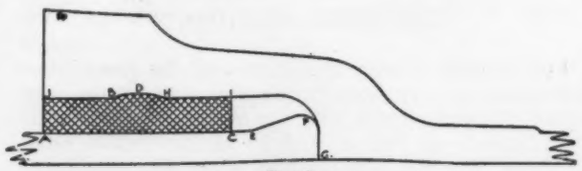


Figure 2
Standard A. G. A. Bell

Corner J should be sharp. Distance J-B should be at least 1 in. Slope B-D is too steep in standard bell, and the groove should be made elliptical and not so accentuated.
E-F should be made longer so as to give better opportunity to wedge the yarn between bell and spigot.
Surface J, B, D, H, I, and A, C should be smooth and clean.
Depth of bell should be slightly greater than that of the standard bell, and possible made equal to that of the B bell, although this is not necessary if straight lead joints are to be used, but is desirable if joints are to be made with cement, or a combination of cement and lead.

No recommendations have been made with reference to oxy-welded and other types of joints as the data is insufficient from which to draw conclusions. The whole report, especially the tables and appendix, should be carefully studied. Such data as received indicated that steel pipe, properly oxy-welded, would give nearly 100 per cent. satisfaction. Certainly oxy-welded joints, where properly made, have proven to have exceptional merit.

Discussion Developed

A lively discussion of those attending the session developed at the close of the report of the committee on pipe joints and pipe coatings. It was evident that there was far from a consensus of opinion as to when pipe coating should be specified, but a very thorough agreement with the idea presented by Mr. Hagerman that extended soil-corrosion studies are very necessary.

The question of high-pressure gas welded pipe lines or bronze-welded cast-iron pipe lines came in for extended comment. In this connection the experience of one engineer who had had difficulty in making repairs on welded lines was answered by other operators who pointed out the convenience of using oxy-acetylene cutting to remove the broken portions and the great convenience of fitting in new pieces of any desired length when welded lines are for any reason broken.

The magnitude of leakage losses on lines which are not tight was brought out by the experience of Mr. Armbruster, who reported the rehabilitation of one system which has been in progress since 1922 with consequent reduction in leakage losses of 750 million cubic feet. Increase in leakage losses was reported by Mr. Flowers in the San Antonio system as a result of the change from manufactured to natural gas. Under the old conditions the leakage was approximately 8 per cent of send-out, whereas now with natural gas of from four to five times as great a send-out the leakage loss has been as high as 23 per cent. Steps have, of course, been taken to correct this excessive loss.

Presentation of discussion on leakage and pipe-joint problems repeatedly developed the urgent recommendation of the engineers in attendance that more careful pipe-joint and leakage records be kept in order that the industry could more rapidly accumulate reliable information and experience to guide its future distribution practice.

CHEMICAL SESSIONS

For the first time in the history of the Association simultaneous meetings of the chemical group were held at the same hours with the meetings of the Technical Section on two afternoons of convention week. At these sessions considerable attention was given to the fundamental composition, the agglutinating power, and the clinker-forming characteristics of coal; to the problems of formation and determination of carbon-disulphide in gas, and on the methods for determining naphthalene in gas.

A paper by Dr. Wilfred Francis, who is associated with the U. S. Bureau of Mines as the exchange representative of the British Safety in Mines Research Board, was entitled, "The Composition of Coal in Relation to Spontaneous Combustion." Dr. Francis described very fully the various methods by which the fundamental composition of coal had been investigated, both of methods of analysis, splitting coals into ingredients by solution or by other means, and the methods of investigation which relate to the materials from which the coal is known to have been formed.

Carbon Disulphide in Gas

The question of organic sulphur compounds in gas was discussed under the leadership of three speakers. W. J. Huff presented a second paper on the subject of "The Carbon-Sulphur Complex." In this he discussed the probable mechanism of the formation of CS_2 in gas. Dr. Huff's paper was supplemented by a resume of recent literature on the subject which was prepared in co-operation with John C. Holtz, also of the Department of Gas Engineering, Johns Hopkins University.

Two proposals were made to the group as to methods for determining carbon disulphide. N. F. Prince, of the Rochester Company, discussed a modification of the Weiss aniline absorption method and G. G. Desy, of the Koppers laboratory, recommended a modified xanthate method which he believed to be accurate within about 2 per cent. of the amount of CS_2 present.

Clinkering Property of Coal

A paper by A. C. Fieldner and associates, of the U. S. Bureau of Mines, dealt with studies on 21 coals ranging in ash fusibility, as measured by ordinary methods, from 1990° to 2930° F. The clinkering characteristics of these coals were investigated in a specially designed hand-fired furnace.

"The experimental burnings were made on the over-feed or hand-firing method. The most definite numerical scale developed was to take the weight of clinker which would not pass a 2-in. screen, and to express it as a percentage of the total weight of fuel-bed refuse. The following conclusions are justified when using this scale:

"(a) The quantity of clinker formed decreases as the rate of burning increases, although the density and fusion of the clinker pieces are greater at the higher rates. The rate of decrease of quantity with rate of burning becomes less when the coal ash-fusion temperatures are low.

"(b) The quantity of clinker formation has a fairly definite relation to the softening temperature of the coal ash as determined by the standard gas-furnace method. It decreases with increase of temperature, and has small change for coals having a softening temperature greater than 2600 deg. Fahr.

"(c) This relation is better expressed by using the softening temperature than it is by that of the initial or fluid temperatures.

"(d) The relation becomes more consistent as the size of the coal decreases. The influence of the size of coal pieces on the quantity of large clinkers is greater as the large pieces of extraneous matter are more refractory, and are not maintained at their fusion temperatures sufficiently long to slag completely.

"(e) The two coals received in the as-mined and the washed conditions showed a reduction of clinker formation on the scale used greater than that due to the proportion of inorganic matter removed.

"(f) No better relation can be obtained from the softening temperatures of the ash of the float-and-sink portions of the coal separated by fine grinding and using a liquid of 1.35 specific gravity.

"(g) No consistent relation was found between the softening- or the flowing-temperature interval and the clinker scale."

Agglutinating Value of Coal

A paper on this subject was presented by W. H. Fulweiler and T. K. Cleveland.

"The fact that the proximate analysis of a coal gives no indication of its coking qualities has long been recognized. Also, a coke which contains the highest proportion of agglutinant, that is, of beta and gamma compounds (to which the coking of coal is now fairly definitely attributed) does not necessarily form the best coke under the ordinary conditions of carbonization. As a result, many investigators have submitted from time to time methods for determining the coking quality or agglutinating value of a coal.

"Apart from the application of the agglutinating values of a coal toward predicting its coking qualities, it has been hoped that these tests also might be applied successfully to a coal used in water-gas generators. The ideal coal for water-gas manufacture, i.e., that showing the highest relative operating efficiency, should show a relatively low agglutinating value. Such a relation is obvious when it is recalled that a coal, whose lumps fuse together forming a matted covering over the top of the fuel bed, has a tendency to develop blowholes and consequently show a decreased efficiency. On the other hand, a coal not so rich in agglutinating material will retain its original lump formation, giving a fuel bed possessing a relatively large number of comparatively small uniform interstices through which the blast and steam may pass with maximum efficiency. A few preliminary experiments have indicated that some of the best coals have agglutinating values as low as 1:14, or even less.

"Some of the conclusions drawn from the results of the agglutinating tests are as follows:

"1. In general, the agglutinating value of a coal cannot be deduced from the determination of its volatile combustible matter content.

"2. For coals in any well-defined locality a definite regular relation between the above mentioned characteristics may possibly exist.

"3. The results of a coking test do not give a definite conclusion as to the agglutinating value of a coal and vice versa.

"4. A definite relation between the agglutinating value of a coal and its relative operating efficiency in a water-gas generator seems possible."

Naphthalene Determination

A symposium on methods for determining naphthalene in gas developed from two papers on this general subject. The first paper, by W. H. Fulweiler and associates of the U. G. I. laboratory offered the following conclusions:

"We have shown that indene is not precipitated by picric acid in the concentrations that normally exist in gas.

"That indene and other unsaturated hydrocarbons that react with bromine are absorbed when gas is passed through a suspension of naphthalene picrate and picric acid.

"That until some specific method can be devised for determining either naphthalene or indene it will be difficult to determine the exact error in the usual titration method for determining naphthalene.

"We have found that the bridge method for the determination of naphthalene is not affected by the presence of indene in amounts up to 50 grains per 100 cu. ft. and where the amount of naphthalene determined is 2 grains or more per 100 cu. ft."

In contrast with these, A. R. Powell, of the Koppers Company laboratory, presented a summary and conclusion of his work in the following language:

"The effect of the following factors on the picric acid method for determining naphthalene have been studied and the results given.

"1. Rate of Gas Flow.—For any particular method the gas flow should be as rapid as possible without loss of naphthalene due to non-reaction with the picric acid.

"2. Concentration of Picric Acid.—The best concentration of picric acid for use at ordinary temperatures is 0.05 normal. If the solution is much stronger than this, the picric acid may crystallize at ordinary temperatures. If much weaker, the naphthalene determination will be low, due to an incomplete precipitation of naphthalene. However, at lower temperatures, it may be necessary to use weaker picric acid, under which conditions the determination may be as accurate as with the stronger picric acid at ordinary temperatures.

"3. Effect of High Temperature.—At temperatures higher than normal, the naphthalene determination will be low, due to incomplete precipitation.

"4. Effect of Low Temperature.—The temperature must never fall below the saturation point of the picric acid solution, or the results will be high, due to precipitation of picric acid.

"5. Ammonia in Gas.—All gas contains some ammonia and this must be removed by sulphuric acid washing before it enters the picric acid. Otherwise the results will be high.

"6. Gum-forming Constituents in Gas.—Certain unsaturated compounds, such as indene, react with picric acid to form compounds very similar to naphthalene picrate. The results of the naphthalene determination by picric acid therefore not only include the naphthalene, but also indene and other compounds which contribute to gum formation in gas distribution systems.

"7. Sulphur Dioxide in Gas.—Water gas contains sulphur dioxide, particularly where a blow run or a very extended purge is used. It is necessary to remove this from the gas before contact with the picric acid, or the naphthalene results will be low.

"8. Hydrogen Sulphide and Carbon Dioxide in Gas.—These constituents have no appreciable effect on the naphthalene determination when methyl red is used as indicator in the titration.

NOTICE

Due to the unlooked-for length of this report, it has been found necessary to forego the publication of Willien and Stein's paper, "Manufacture of Low Gravity Water Gas," until our December issue.

Taken from Previous Issues of the American Gas Journal

TEN YEARS AGO

C. N. Chubb has resigned as manager of the South Bend interests of the Northern Indiana Gas & Electric Company, and will leave November 1 to become manager of the Peoples Light Company of Davenport, Iowa, one of the interests of the Tri-City Railway & Light Company. Mr. Chubb came to South Bend May 1, 1915, from the company's plant at Michigan City.

The People's Gas Light & Coke Company of Chicago employees responded en masse to the Second Liberty Loan. Thirteen hundred and eighty-one—approximately half the total number of persons on the payroll—have bought bonds aggregating $82,200. Almost every employee who bought a second loan bond is also the owner of a Liberty bond of the first series.

The Counties Gas & Electric Company of Norristown, Pa., at its recent monthly meeting of the employees there, was given a big boost for the Liberty Loan campaign, and at the close subscriptions to the amount of $6,000 were placed. After congratulating the employees upon the success of the event, H. H. Ganser, superintendent of the company, spoke of the Liberty Loan campaign, and when he had completed his appeal for subscriptions those present came forth, pledging the above amount within a few moments.

W. Griffin Gribble, formerly with the John J. Griffin Company, of Philadelphia, Pa., is now captain of Company A, Thirtieth Engineers, Gas and Flame Service.

TWENTY YEARS AGO

Mayor Dimmick, of Scranton, has put his signature to the resolution passed by the City Councils instructing the Director of Public Works, the City Solicitor, the Mayor, and, acting with a committee three members from each councilmanic branch, to arrange for an option on the plants of the Scranton Gas and Water Company with a view to acquiring same for operation on municipal account.

Superintendent Bixby is breathing easier and resting longer nowadays, and nights, since the completion of the emergency plant of the water gas type recently completed for the Springfield (Mo.) Company. He told me not to say anything about the way business was increasing in the district, for fear he would be again considered as in the market for additional apparatus. He seems to think it is about time that the shareholders should get a sensible return on their investment.

The employees of the Chelsea, Mass., Gas Light Company have formed an organization, the aim of which is their betterment from a technical point and for better personal acquaintances. The sessions are to be held monthly, and the organization president is Mr. Joseph M. Riley. The secretary is Mr. A. E. Mace. The first session was held about a fortnight ago, during which a speech by Mr. Mace, on "Transformers," led to a spirited discussion. Another feature was a collation interspersed with short speeches, the recital of some "nonsensical things," etc. The meetings are to be held for the time in the electric light station business room, but before the winter ends another assembling place will have been selected. "Unions" of this type are sure to increase in number and in value.

FORTY YEARS AGO

Getting Ready for the Winter's Work.—The Stacey Manufacturing Company is constructing two gasholders on the Water Street property of the Fall River (Mass.) Gas Company. We understand that this construction will put an end to many a complaint indulged in of late years by the Fall River gas consumer, who seems to be somewhat crankier than even the average growler of his class. It appears that the old holders were enclosed with wooden housings, and that fact led some consumers to ask how it was "possible for them to obtain a good supply of gas when the company employed barns for storehouses."

A Bit of Baltimore (Md.) Gossip.—Mr. E. C. Benedict, speaking on the subject of the changes now going on concerning the Baltimore gas companies, said: "We propose in the consolidation to utilize the plant of the Equitable Company in manufacturing cheap fuel gas for the purpose of generating heat and power. We will begin, say, by charging 75 cents per thousand cubic feet, and, it may be, provided we secure consumers enough, that we can furnish it for less."

Policemen Do Not Want to Act as Lamplighters. — The Pittsburgh (Pa.) Dispatch says that the policemen in the adjoining city of Allegheny are busy buttonholing councilmen about a grievance which they want remedied. The police are required to light the lamps and put them out before reporting off duty at 5 a. m. During the winter months that is an early hour to extinguish the lights, and the workingmen have to stumble along the dark streets to their shops. In order to save two hours' time before reporting for duty, the police are compelled to hire boys to do the lighting up, and this costs the guardians of the peace about $15 per annum each. They believe this is unjust, and in order to have the streets illuminated until daylight, which cannot be done under the present system, they will solicit councils to employ regular lamp lighters.

SIXTY YEARS AGO

The great desideratum in heating our dwellings and cooking our fuel is to have a gas fuel, provided it can be employed without the objections which have always existed in its use to a greater or less extent—namely, expensiveness, disagreeable odor, and injury to the health.

This has been accomplished by inventions made and patented by the Rev. D. G. Haskins, of Cambridge, Mass. Unqualifiedly we can say that the economy of gas, the development and utilization of heat, and perfect freedom from odor and anything deleterious to health, are elements of excellence and superiority in this apparatus which have never been attained heretofore. Strictly mechanical, scientific and chemical principles are combined in the construction and operation of the apparatus, which are sure to make it popular with the public, and profitable to the inventor. The apparatus is on exhibition at Messrs. Ford & Murray's chandelier and gas-fitting establishment, No. 58 East Thirteenth Street. A sample heater and baker may also be seen at this office. The inventor desires to have some responsible party or parties manufacture to supply the market. For particulars apply to or address M. L. Callender, 22 Pine Street, or Messrs. Ford & Murray as above.

FINANCIAL NEWS

CAPITAL FLOTATIONS OF GAS COMPANIES DURING SEPTEMBER AND OCTOBER, 1927

Company and Issue	Purpose of Issue	Price	% to Yield About	Amount
American Natural Gas 6½% sinking fund gold debentures, due 1942.....	Corporate purposes	99½	6.55	$1,000,000
Associated Gas & Electric Co. Preferred stock $6 dividend series (no par value)...	Refunding	95	6.32	*25,000
Central Power & Light Co. 1st mortgage 5% gold bonds, 1956 series.....	Corporate purposes	97	5.20	$4,000,000
Dixie Gulf Gas Co. 1st mortgage 6½% sinking fund gold bonds, series A.	New company	99½	6.55	$9,500,000
Preferred stock, $7 dividend series, cumulative, redeemable at 30 days' notice at $110 a share....	New Co. (per unit)	$100	...	*37,500
Federated Ntilities, Inc. 1st lien collateral trust gold bonds, 5½%, series of 1927, due March 1, 1957.....	Acquisition & Refdg.	94¾	5.87	$3,500,000
Iowa-Nebraska Light & Power Co. 1st lien & refunding mtg. 5% gold bonds, series A...	Acquisitions	96½	5.20	$12,000,000
Jersey Central Power & Light Co. 1st mtg. & ref. 20-year 5% gold bonds, series B....	Corporate purposes	96½	5.25	$2,300,000
Long Island Lighting Co. 6% cumulative preferred stock.....	Add'ns & improvem'ts	$100	6.00	$1,000,000
New York Power & Light Corp. 1st mortgage gold bonds 4½%, series due 1967.....	Ref. & payment of debts	96	4.72	$66,000,000
Pacific Gas & Electric Co. 1st & ref. mtg. gold bond, series E, 4½%, due 1957..	Corporate purposes	96	4.75	$15,000,000
Peoples Gas & Fuel Co., Inc. (Shreveport, La.) 1st mtg. 6½% sinking fund gold bonds, series A...	Acquisitions	98	6.75	$1,000,000
Public Utilities Consolidated Corporation (Arizona). 1st mtg. 6% gold bonds, due 1947.....	Acquisitions	100	6.00	$1,250,000
Queens Borough Gas & Electric Co. 5% ref. mtg. gold bonds, 1955 series.....	Corporate purposes	103½	4.75	$1,200,000
St. Louis Gas & Coke Corp. 1st mtg. sinking fund gold bonds, 6% series, due 1947	Corporate purposes	97	6.25	$10,000,000
Southern California Gas Company 1st mtg. & ref. gold bonds, 5% series, due 1957....	Corporate purposes	99	5.00	$8,646,000
Southern Gas Utilities, Inc. 1st mtg. 6½% sink. fund gold b'ds, series A, due 1939	Acqui. & Corp. purposes	99	6.60	$2,250,000
Southern Cities Utilities Corp. 1st lien collateral trust 1 yr. 5% gold notes.....	Corporate purposes	99¾	5.25	$2,000,000
Western United Gas & Electric Co. 1st mtg. 30-year 5% gold bonds, series B, due 1957..	Add'ns & improvem'ts	99½	5.02	$1,500,000

* Shares.

Gas Companies' Earnings

Adirondack Power & Light Corporation reports for 12 months ending July 31, 1927, gross of $9,576,516 and net of $1,532,823, as against gross of $8,877,906 and net of $1,451,438 for preceding 12 months.

Associated Gas & Electric System reports for 12 months ended July 31, 1927, gross earnings of $32,797,670 and net of $1,485,263, as against gross of $27,194,325 and net of $1,571,307 in preceding 12 months.

Blackstone Valley Gas & Electric Co. (including subisidiaries) reports for 12 months ended June 30 gross earnings of $5,748,455 and net balance of $1,429,430, as against gross of $5,317,640 and net balance of $1,440,636 for preceding 12 months.

Cities Service Co. reports for 12 months ended September 30 gross earnings of $31,637,049 and net to common stock and reserves of $21,287,798, as

against gross of $23,029,845 and net of $13,595,608 for preceding 12 months.

Coast Counties Gas & Electric Co. reports gross earnings of $1,792,153 and balance (re-invested in betterments, etc.) of $118,245 for 12 months ended August 31, 1927.

Columbia Gas & Electric reports for 12 months ended July 31, 1927, gross earnings of $96,310,024 and net income of $23,696,676.

Commonwealth Power Corporation (and subsidiaries) reports for 12 months ended September 30, 1927, gross earnings of $52,408,357 and net balance of $6,285,427, as against gross of $48,164,951 and balance of $4,623,431 in 1926.

General Gas & Electric (income account—parent company only) reports for year ended June 30, 1927, total revenue of $1,989,060 and surplus of $648,026.

Louisville Gas & Electric Co. (Del.) reports for 12 months ended August 31, 1927, gross earnings of $8,690,360 and net earnings (before providing for retirement) of $4,464,701, as against gross of $8,509,116 and net of $4,332,572 in preceding 12 months.

Midway Gas Co. of San Francisco report for first eight months of this year shows a net after depreciation, taxes and interest of $524,825, against $463,800 in the same period last year. Gross earnings totaled $2,479,343 against $3,065,314 in the corresponding period of 1926.

New York State Gas & Electric Corporation reports for calendar year ended December 31, 1926, gross revenues of $2,806,684 and balance left for dividends and surplus of $737,285.

Oklahoma Gas & Electric Co. (including all properties now in system for full periods) reports for 12 months ended August 31, 1927, gross earnings of $12,905,209 and net earnings (before provision for retirements) of $4,948,741, as against gross of $10,903,922 and net of $3,907,189 for corresponding period in 1926.

People's Gas Light & Coke Co. (including subsidiaries) reports for 12 months ended September 30, 1927, gross revenues of $39,665,378, and net income after charges of $5,235,125, as against gross of $38,260,361 and net of $5,322,656 for corresponding period in 1926.

Southern Indiana Gas & Electric Co. reports for 12 months ended August 31, 1927, gross earnings of $3,011,177 and balance after charges of $348,743, as against gross of $2,820,681 and net balance of $261,716 for preceding 12 months.

United Light & Power reports for 12 months ended July 31, 1927, gross earnings of $43,901,957 and surplus (before depreciation, amortization and common stock dividend) of $5,721,000, as against gross of $40,289,625 and surplus of $6,150,153 in preceding 12 months.

Book Review

The Industrial Gas Salesman, by Elmer E. Ferris, New York. American Gas Association. 113 pages, $1.50.

Textbooks on any phase of selling are generally looked at askance by those who are earning their livelihood through the medium of salesmanship. However, in this compact volume Professor Ferris, of the School of Commerce, New York University, has furnished a text that merits a careful perusal by everyone engaged in the selling of gas for industrial purposes.

Professor Ferris, in a concise but sufficiently thorough manner, gives a history of the gas business and speculates as to its future growth. He next proceeds to discuss the nature and size of the market for industrial gas and advises as to where one can find data concerning the various appliances. The reader is then told of the best methods for approaching and arousing the interest of the prospect and finally closing the sale. Sales resistance is dealt with in a quite thorough manner and the appendices set forth information of no small value; the latter giving facts and figures on the comparison of various fuels for accomplishing several heating operations, and additional examples of closing a sale.

The strength of this treatise lies in the fact that it has been approached from a purely practical angle and is refreshingly free from high-sounding theory.

It is worth mentioning that the author himself has done a vast amount of selling during his business career.

Natural Gas Handbook, by John C. Diehl, Erie, Pa. Metric Metal Works. 578 pages, profusely illustrated, $5.00.

This fourth edition of the Natural Gas Handbook quite surpasses its three predecessors. It is a complete handbook on the subject of natural gas, from the gas well to utilization in the appliance.

The information and data on domestic and industrial appliances as to their correct design and operation are particularly good. The tables of various gas engineering data have been taken from authoritative sources and the illustrations really reinforce the written matter instead of tending to confuse, as is often the case with a handbook.

Natural gas men will find this volume indispensable and many in the artificial gas business would do well to have the same on their bookshelf.

"A Brief History of the Natural Gas Industry"

By H. C. ZWETSCH
1927 Edition
Copy sent upon request

Zwetsch, Heinzelmann & Co.
Inc.

Specialists in Natural Gas Securities

57 William Street New York

You'll sell more Gas Ranges if you sell one or more of these six famous makes—

QUICK MEAL
DANGLER
DIRECT ACTION
CLARK JEWEL
NEW PROCESS
RELIABLE

Equipped with the famous

LORAIN

It's *More Profitable* for You to Sell Red Wheel Gas Ranges

A PROBLEM today with most merchants is to get more people to come to their place of business. Probably the quickest and the easiest way to do this is to slash the selling price of your merchandise to a point where there is no longer any profit in it for you.

The next method in order of importance, and the better way, is to sell merchandise that can be classified as famous in one respect or another.

The six brands of gas ranges equipped with the famous Red Wheel Lorain Oven Heat Regulator, and which are manufactured by American Stove Company, are undoubtedly the most famous products in their line.

The several brand names were well established and stood for quality merchandise when the oldest of us were still in school. For many, many years these trade names grew in importance in the public mind through sheer merit of the products themselves and through the reputation of American Stove Company for square dealing.

Then, nearly nine years ago, on top of this solid foundation, American Stove Company began to build a huge structure of public good-will through national advertising.

This structure of national advertising built around and about the Lorain Oven Heat Regulator had revolutionized the design and construction of gas ranges, has made the business more profitable and of far wider scope, and has been the greatest factor in the public's present day acceptance of gas as the ideal fuel for home cooking.

Today the six makes of ranges manufactured by American Stove Company and the famous Red Wheel Regulator with which they are equipped are known the world over. Scarcely a woman lives who intends to buy a gas range that cannot be sold a Red Wheel Gas Range in less time and with less effort than any other make.

This is true because the millions of dollars that have been spent on advertising Red Wheel Gas Ranges have, without question, performed the most difficult part of the task of selling, namely, making the product immediately acceptable to the public.

There may be very good reasons why you believe it to be more profitable for your clerks and yourself to spend your good time convincing a woman that some unknown brand of gas range is as good as a Red Wheel Gas Range.

But, we believe that you will find it more profitable and that your trade will be better satisfied if, upon their first inquiry for a new gas range, you lead them directly to one equipped with the Red Wheel, without the slightest necessity for excuses, reasons or vague explanations for handling them to the exclusion of all other makes. At least, try this plan for a time and judge for yourself.

AMERICAN STOVE COMPANY

801 Chouteau Ave. :: **St. Louis, Mo.**

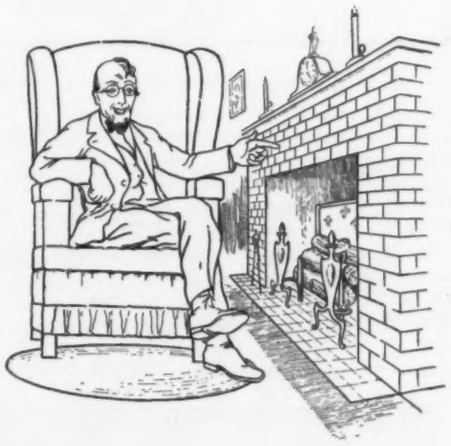
World's Largest Manufacturers of Gas Ranges

THESE FAMOUS GAS RANGES ARE EQUIPPED WITH LORAIN:

DIRECT ACTION	NEW PROCESS	CLARK JEWEL
DANGLER	QUICK MEAL	RELIABLE

10-11-12-27

"Andy Iron" Says—



"Gosh, folks, but it wuz a great show out Chicago way! Booth 71, where we wuz located, wuz so all-fired full of people most of the time y'u could sca'sly move. Great Jehosaphat! How folks did admire the Homestead Fires! Couldn't keep their eyes offen them, they looked so nacheral.

"Y'u gas men otto take a tip from what y'u saw an' heard—I noticed many of y'u listenin' —and give the public what they want. Honest injun, don't y'u think I'm right?"

Yours truly
Andy Iron

The Ladies Want Beauty and Utility

Homestead Fires will supply both of these essential to the decoration and warming of the home. Homestead "Woodfires" when "cold," can hardly be distinguished from the real logs of granddad's day. Natural looking bark, axe marks, knots and andirons combine to produce a decorative effect that makes beautiful those ugly, gaping holes called fireplaces, so prevalent today.

Homestead "Woodfire"

Lighted, the soft glow of the seemingly burning embers and the real radiant heat emanating therefrom fill the beholder with a sense of peaceful contentment and genial warmth.

Homestead "Coalfires," patterned after the English Coal Basket glow with lifelike naturalness in their antique containers and bring delight to those who favor this type of fire.

Homestead Fires are so novel they require very little sales effort because they embody the two essentials: BEAUTY that fits in admirably with any decorative scheme and UTILITY that supplies an abundance of clean, radiant heat There's profit and good-will to be obtained in their sales.

HOMESTEAD HEATER COMPANY, Inc.

Selvage Street and Fabyan Place WALTER KENNEDY, PRESIDENT **Newark, N. J., U. S. A.**

Equipment News

U. G. I. Intermittent Chamber Oven

The U. G. I. Intermittent Vertical Chamber Ovens are unique in that the coal is charged into the top and discharged by gravity from the bottom, thereby eliminating a large amount of charging and discharging machinery.

To charge the ovens a traveling motor driven weigh larry travels on trucks above the ovens and deposits its charge without loss of time and spilling of the coal on the charging floor.

After the proper carbonizing time has elapsed, the lower mouthpieces are quickly opened by means of a hydraulic operating mechanism which allows the coke to drop into a quenching car and be removed to the coke quenching station. This car is propelled by means of a motor driven cable haul system.

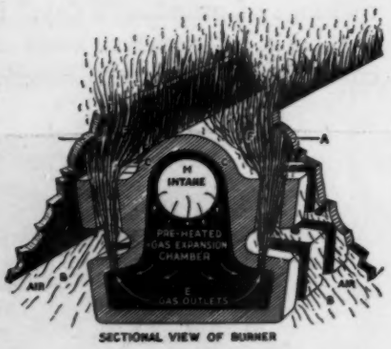
In the case of the installation at Racine, Wis., the benches will be arranged to be heated with hot producer gas, which will enter the setting at the recuperator side of the benches, and after further preheating in the upper part of the recuperator, will pass down to the burners at the lower end of the chamber oven, where it meets the preheated secondary air and combustion takes place.

The producer gas for these ovens is generated in the Standard U. G. I. Pressure Producer. This equipment is built to serve as a low pressure steam boiler, in addition to its function as a producer, and will provide nearly enough steam for its own operation. An eccentric conical revolving grate with plow and outside water-sealed ashpan provides a continuous means of crushing clinker and removing ashes without interruption to the operation of the producer. With equal facility the fuel is charged into the producer from a hopper mounted on the producer head, which revolves, and thereby enables the fuel to be quickly and evenly distributed over the fire.

After ignition, the producer gas is directed by baffles in a vertical winding path back and forth across the face of the ovens, and imparting its heat to the coal to be carbonized. Numerous dampers are arranged so that close regulation of this heat is obtained.

The Hall-Toledo Gas Burner

This burner, which is adapted for use with natural, artificial or mixed gases, has no pre-mixer and no adjustments; it automatically makes its own mixture and is claimed to give perfect combustion. It will operate on any usual gas pressure and can be used for a great variety of domestic and industrial heating installations. However, best operating conditions are obtained at low pressures without any attendant backfiring.



SECTIONAL VIEW OF BURNER

Its installation is a simple matter. Below follows a description:

Raw, unmixed gas enters the body of the burner at pipe hole H, the chamber walls C being heated by flames F, expands gas which passes through orifice E. There it takes the shape of a fine pencil of gas picking up its primary air, passing through the mixing tube B. This mixing tube B is of a set predetermined size, making a perfect mixture at low pressure or medium burning. This mixture then passes upwards making contact with baffle plate A where it receives its secondary air, making complete combustion at all pressures.

Additional details and catalog may be had from The Hall Manufacturing Company, Toledo, Ohio.

Signals: 15-22-28!

With these three numbers Welsbach carries your Sales quotas right through center for a touchdown . . . Welsbach Radiant Heaters straight-arm sales resistance. The three astounding prices give you a change of pace that baffles would-be tacklers. The famous Welsbach burner, the very heart of the devise, is the greatest heat producer that ever played against Jack Frost.

The "Welsbach" is a gas man's heater. Its efficiency and flexibility assure him of perfect operating results under trying conditions. And here is the rare case where quality, good looks and reasonable price have been adroitly combined. . . . If you've moved your goal posts back this season, you'll need these three products in your line-up to win.

Welsbach Radiant Heaters

WELSBACH COMPANY, GLOUCESTER CITY, N. J.

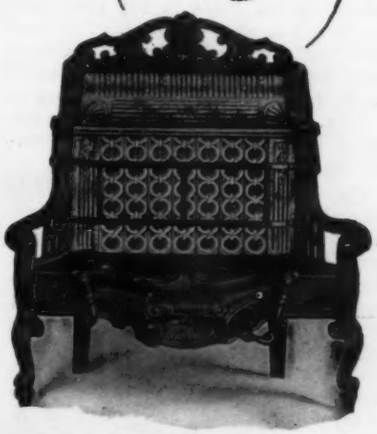
OFFICES IN PRINCIPAL CITIES

Member of American Gas Association

Approved by the
A. G. A. TESTING LABORATORY

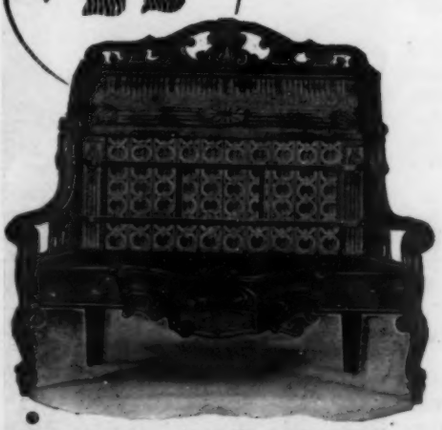
Approved by
GOOD HOUSEKEEPING INSTITUTE

$15



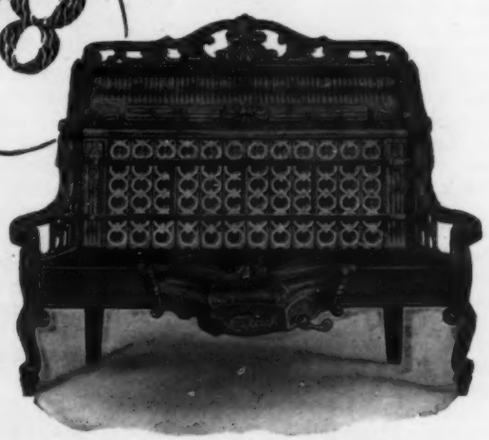
No. 51—Seven glowers. Finish: Silvered Brown. Columns beautifully tinted. Size: 23 inches high, 20¼ inches wide, 11½ inches deep.

$22



No. 47—Ten glowers. Finish: Silvered Brown. Columns beautifully tinted. Size: 23 inches high, 24 inches wide, 11½ inches deep.

$28



No. 49—Twelve glowers. Finish: Silvered Brown. Columns beautifully tinted. Size: 23 inches high, 28 inches wide, 11½ inches deep.

Steere Automatic Grate

The Semet-Solvay Engineering Corporation has developed and now presents to the trade the Steere Automatic Grate. It is claimed to put an end to daily clinkering of water gas machines and make possible complete mechanical operation of the generator.

The Steere Automatic Grate is built of conical-shaped segments, varying in number and dimension according to the size of the generator. The discs which form each grate segment are octagon shaped. The segments are rotated by hydraulic cylinders, each of which will turn several segments. The cylinders derive their energy from the same hydraulic system that operates the machine. The working of the grate is controlled from the operating floor.

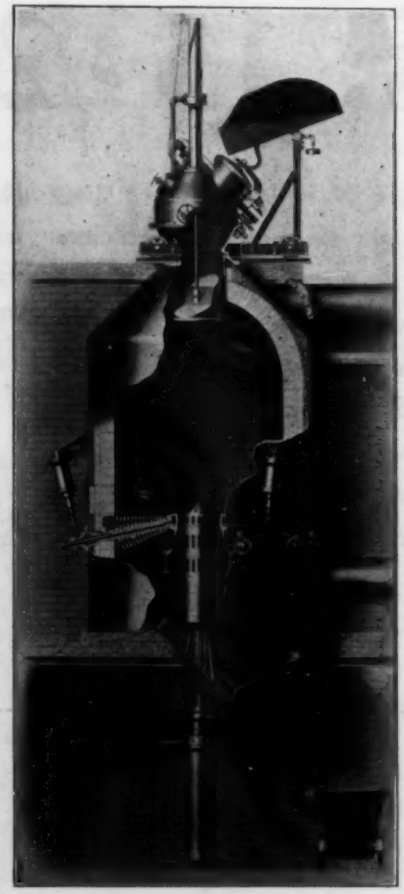
The segments can be regulated to meet any adjustments to obtain the most desirable firing conditions. The length of the piston stroke can be controlled so that the grate segments will move as little as one-fiftieth of the circumference, or they can be completely turned over in eight piston strokes. The number of strokes of the piston in any given unit of time can also be fixed. Any one grate segment can be disconnected from the cylinder or the cylinder itself can be made inactive merely by the closing of a valve. In short, the grate can be adjusted to meet any condition. All control mechanism is readily accessible.

The revolving action of the grate is intermittent. Its hydraulic energy is obtained by connection to the piping that operates the blast or the run, which causes the cylinders to move the grate once on each cycle. It has been found most satisfactory to rotate alternating segments at each operation. This is arranged by adjustment of the pawls so that the alternating segments are moved on the up and down strokes of the cylinders respectively.

The Steere Automatic Grate and the Grate Poker combine to accomplish mechanical clinkering. The poker is located at the center of the grate. It rises vertically into the heart of the fuel bed. It breaks up clinker and crowds fuel against the side walls, where open passages are constantly being erected by the combustion of the fuel, or, in the case of soft coal, by the tendency to shrink away from the side walls.

Clinker and ash are kept loosened by poker. As the grate segments revolve they grind up the clinker and remove it from the generator into the ash pit. An important aim in developing the Steere Water Gas Machine has been to attain operation uninterrupted by frequent shutting down whenever clinker chokes the fires.

Continuous operation requires the substitution of mechanical for manual labor. The first step in this direction was the



Showing Grate Installed

designing of the Steere Charging Machine. It places fuel at the side wall in any sector of the generator where needed, never successively in one spot except at the wish of the operator. The charging machine, by uniform, continuous service, saves all the time which would be needed for fueling by hand.

The second step toward automatic generator operation was the development of the grate poker.

While the charging machine assures the desired fuel supply, the poker maintains uniformity for the combustion process. The Steere grate poker is hydraulically operated. When not in use it is out of the generator, its tip on a level with the grate.

As the grate poker enters the fuel bed, it crowds partially burned fuel into the open spaces. It prevents the formation of large clinker by frequent breaking up. It eliminates the dead center in the fuel bed, permitting the blasts to reach every sector of the generator.

The Steere Automatic Grate contributes continuous clinkering, the final step in mechanical operation of the generator. As rapidly as clinker forms, the grate poker breaks it up and the rolling grate effectively disposes of it. The loss of time and expense of manual clinkering are completely eliminated.

The completely automatic generator is claimed to make more blue gas in a given time and also produce a gas richer in B.t.u.'s. This conserves oil needed to reach any required calorific standard.

With the exclusively patented Steere developments in generator apparatus, the water gas machine can be made as continuous and dependable as the coal gas process in meeting the most exacting production requirements.

Another Use for the Gas Holder

When Col. Charles A. Lindbergh visited Atlanta on his tour of the country, the arrow shown herewith guided him to Candler Field and a safe landing.

The arrow, which is painted on top of the big gas tank operated by the gas department of the Georgia Power Company, was completed the day before Lindbergh arrived, a force of men working all night in order that the famous aviator might have its help in making a landing.

The arrow, painted in white against the dark buff of the tank top, is 132 feet long and five feet wide. The letters in the words "Atlanta Field" are sixteen feet high and two feet wide, the whole being easily read from a great height and giving visiting airmen a direct route to Candler Field some distance from the center of the city.

At night flood lights attached to the frame of the gas container illuminate it brilliantly so that it can be seen further after dark than in the daytime.

GAS PRESSURE REGULATOR OF REDUCING VALVE

Type No. 211 Flanged

For Medium and High Pressures

FISHER

TRADE MARK REGISTERED

A name synonymous with Accuracy, Service and Economy in the regulation, control and distribution of either manufactured or natural gas.

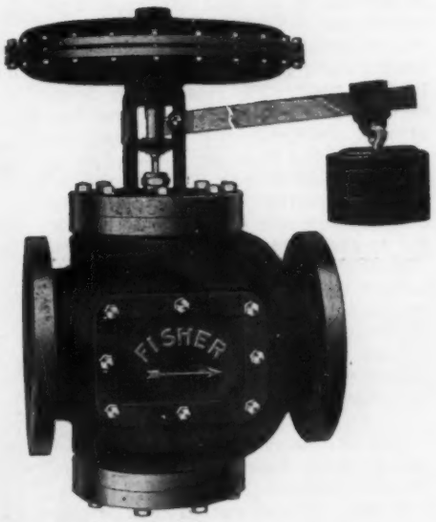
Type No. 205, Exterior With Mercury Seal Relief Valve

BELOW—GAS PRESSURE REGULATOR OR REDUCING VALVE *For Low Pressures*

RIGHT—GAS PRESSURE REGULATOR OR REDUCING VALVE *For House Service*

Realizing as we do, from our long and extensive experience in both these gas fields and their allied industries, the essential value of absolute dependability required in the devices designed to perform these vital functions of regulation and control, we have built accordingly.

Therefore, into each one of the Fisher Specialties, we have incorporated correct mechanical design, the best materials and skilled workmanship of a high order, to the end that the name of Fisher will always appear as a worthy symbol of a worthy product.



Type No. 210 Flanged

Send for Descriptive Bulletins No. 6 and 7

THE FISHER GOVERNOR CO.

10 FISHER BUILDING MARSHALLTOWN, IOWA, U. S. A.

Regulators - Governors - Valves

NEWS OF THE GAS INDUSTRY

Material Increase in Number of Domestic Consumers of Natural Gas in 1926

The comparatively slow but steady growth of the natural gas industry in the United States was continued in 1926, when 1,313,019,000,000 cu. ft. of gas was produced and delivered to consumers, an increase over 1925 of 10 per cent, according to the United States Bureau of Mines, Department of Commerce. Of this amount 166,000,000 cubic feet was piped to Mexico and Canada, leaving 1,312,853,000,000 cu. ft. as the total internal consumption in 1926. The value of the gas per thousand cubic feet at the wells and at points of consumption showed increases over 1925, the former rising from 9.4 to 9.5 cents, the latter from 22.3 to 22.8 cents. In neither case, however, was the price of 1923 and some previous years attained.

Domestic household consumers used 22 per cent of the total consumption of natural gas in 1926, leaving 78 per cent for industrial consumption. This indicates a slight growth on the part of the latter in 1926. The total return, however, from domestic consumption was greater, since domestic users paid an average of 58.1 cents per thousand cubic feet as compared with 12.8 cents for industrial concerns. In 1926 there were 3,731,000 domestic consumers of natural gas as compared with 3,508,000 in 1925. This represents a gain of 223,000 which is, with the exception of 1913 and 1922, the largest yearly increase ever recorded. California and Texas each recorded an increase of about 70,000 in number of domestic consumers and far surpassed the other States in this respect.

The relative rank of the three chief gas-producing States was unchanged in 1926. Oklahoma, which ranks first, recorded a 15 per cent gain in output; California, which ranks second, a 9 per cent gain; but production in West Virginia, the next ranking State, showed a slight decrease. Texas registered a material gain in output and not only took fourth place from Louisiana but threatens to displace West Virginia in the near future.

The total consumption of natural gas (including residue gas from natural-gas gasoline plants) by industrial users in 1926 amounted to 1,023,678,000,000 cubic feet, an increase over 1925 of 12 per cent. The consumption of natural gas for field and industrial uses, exclusive of carbon black, again showed an increase.

The interstate movement of natural gas in 1926 amounted to 209,527,000,000 cubic feet, a slight increase over the previous year. The movement from West Virginia to Ohio and Pennsylvania continued to be of first importance. Of more than passing interest was the increase in the counter movement of gas from Ohio to West Virginia.

—•—

Westchester Lighting Company's New Building Officially Opened—Entirely Heated With Gas

Between eight and ten o'clock on the evening of October 3, when the new building of the Westchester Lighting Company, Mt. Vernon, N. Y., was formally opened to the public, nearly eight hundred visitors came to inspect the new headquarters.

Such enthusiasm was shown that it was decided to keep the building open each evening until 10 P. M. during October to give those who have no opportunity of visiting the building during the day a chance to come at their convenience.

While first attention was given to the customers, the employees of the company have had equal opportunities to view the interior of the new building. There was a house-warming on Thursday, October 20, when all department heads and their assistants gathered in the new edifice. Social functions planned for the coming season will afford opportunities for all other members of the "Lighting Company Family" to inspect the newest monument to the company's service in Westchester.

Another meeting of note took place on October 22, the day officially set for the Consolidated Gas Company and its affiliated organizations.

The new building is absolutely fireproof throughout. The floors are of steel and reinforced concrete, the partitions of fireproof tile and all of the doors, windows, trim, base and even the picture moldings are built of steel finished in baked enamel to simulate mahogany.

In the first floor display room the columns, balustrade and mezzanine cornices are of polished Knoxville marble with solid cast bronze railings and windows. The floor of the display room as well as all of the corridor floors are built of marble terrazzo with an alundum mixture which precludes the possibility of anyone accidentally slipping or falling.

The building is heated entirely with gas and the heating plant is one of the two largest gas heating installations in this country. The equipment is in a small building across the street from the new building so that control is of the remote type. In each office there is a small thermometer which is tied in with an independent thermostatic control. As a result, the temperature of each room is kept at the desired degree automatically. There are six gas-fired boilers to heat the whole building and it is interesting to note that to comfortably heat the building during the fall days which we are now enjoying, only one boiler is in use.

The new building is up-to-date, provides every possible comfort for its occupants and every convenience to facilitate the important work carried on within its walls.

RADIANT HEAT
Unlike warm air, Radiant Heat does not
make the atmosphere "stuffy."
It heats only persons and objects in its path.
It travels straight thru moving air or drafts.
RAY-GLO
ASK FOR BOOKLET DESCRIBING RADIANT ENERGY

"Too hot, too uniform, too dry, too depressing"

Use Radiant Gas Heaters, say authorities, to correct these common heating evils!

WITHOUT the stimulating, sun-like energy of live radiant heat, it is impossible to reproduce nature's healthful heating conditions in the home. This fact, known but never fully emphasized by the gas industry, is now being broadcast by leading health authorities.

It was with this knowledge in mind that Ray-Glo Heaters were first designed to develop, by high primary air intake, the most intense flame temperature and to create, by a special blending of clays, radiant elements capable of absorbing and transmitting the greatest possible amount of radiant energy.

As a source of quick auxiliary heat, impervious to drafts and harmless to air humidity, the Ray-Glo Heater is the leading exponent of gas heating efficiency. The fact that it operates, under all gas conditions, without any sort of adjustment, is enough in itself to recommend Ray-Glo to a public which seeks confidence in its appliances and all possible convenience in their use.

THE J. H. GRAYSON MFG. CO., Athens, Ohio

If you did not secure a copy of our complete report on heating for health as issued at the Chicago Convention, write us.

RAY-GLO
REG. U.S. PAT. OFF.
Radiant Heaters

EVERY RADIANT HEATER AVERAGES 20,000 CUBIC FEET OF GAS CONSUMED EACH YEAR

Plans for Gas Research at Purdue University

Officials of Purdue University in West Lafayette, Ind., have announced some of the initial steps they will take in gas research, for which a sum of $50,000 has been donated by the Indiana Gas Association. This money will be handled at the discretion of the university in employing a professor of gas engineering, who not only will broaden the teaching work done in this field, but will put in much of his time in research and extension work.

Under the plans as worked out by a committee of the gas association, instruction in gas engineering will be broadened for both graduate and undergraduate students. One of the first research problems on which work will be undertaken will be a study of the utilization of Indiana coal for the manufacture of artificial gas. It is believed Indiana coal may be used for this purpose and if use is found, the freight rate will lower the cost per ton laid down at the various plants.

Another problem to receive attention will be that of developing a cheap and continuous process for the manufacture of gas. The practical heat value of city gas also is another problem on which work will be undertaken and this will be carried into the field of household uses for heating purposes. In this connection a study of furnace design is contemplated as applied to house heating.

Empire State Gas and Electric Association Holds Annual Meeting

The twenty-third annual meeting of the Empire State Gas and Electric Association was held at the Lake Placid Club, Essex County, N. Y., on October 6th and 7th.

Four hundred people registered for the two-day session. The meeting was one of the largest and the most interesting yet held by the association. The meeting was opened and conducted throughout by the president of the association, Mr. N. M. Brundage, vice-president of the Consolidated Gas Company of New York. Mr. Brundage in his address spoke of the work of the association during the past year and the ever-broadening possibility of association activities.

Following the delivery of a most interesting program of papers and addresses the nominating committee submitted the following report on the election of officers:

For president, Henry O. Palmer, Geneva; for first vice-president, Charles S. Ruffner, Albany; for second vice-president, William J. Welsh, Staten Island; for treasurer, Samuel G. Rhodes, New York City.

For members of the executive committee to serve three years: J. W. Carlisle, Watertown; Sanford J. Magee, Ithaca; E. C. Scobell, Rochester; H. M. Brundage, New York City.

For member of the executive committee to serve two years: G. W. Olmsted, Long Island Lighting Company.

These officers, upon motion, were duly elected.

The committee on time and place of the next meeting recommended Saranac Inn as the next place of meeting, in October, 1928. This report was duly approved.

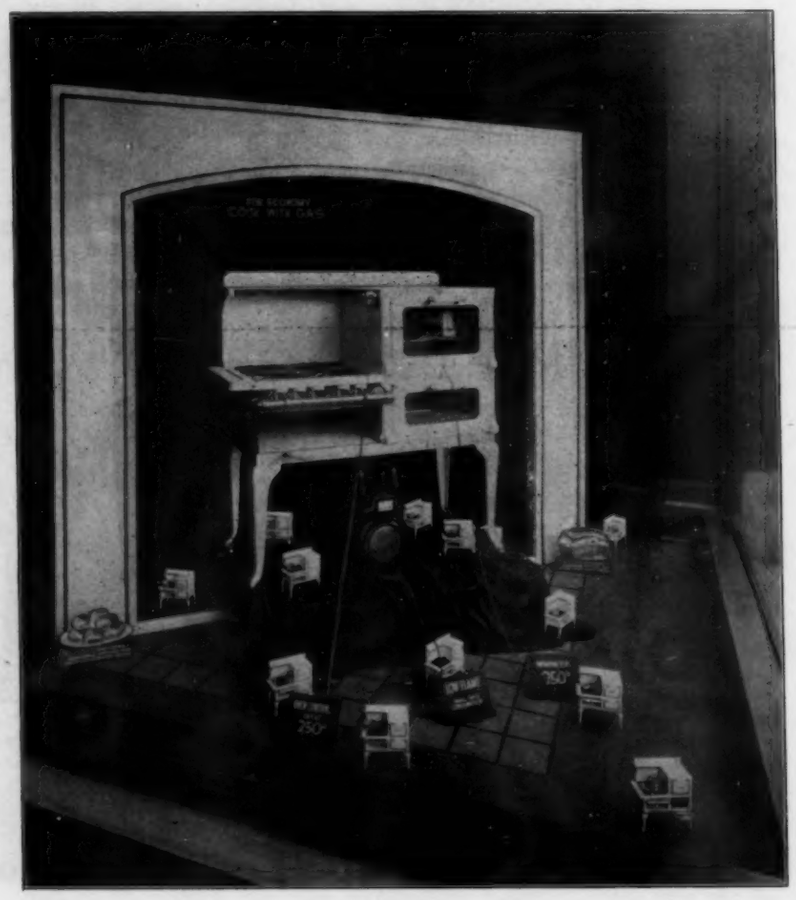
Aside from the business sessions of the meeting, there was a well-balanced program of entertainment.

Note: Some of the papers and addresses will be presented in the abstract in December issue of the American Gas Journal.—Ed.

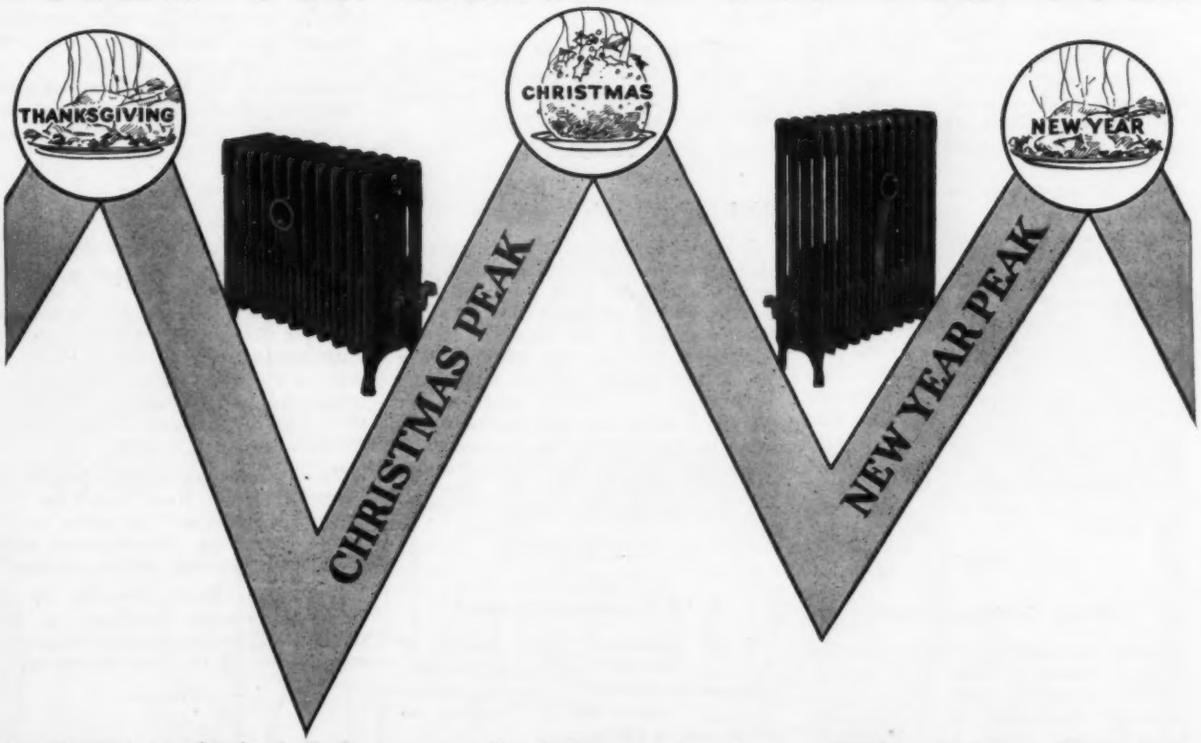
Chattanooga Gas Company's Effective But Inexpensive Window Display

The total cost of working up the window display shown in the photograph was only $13.25, including the large frame for the range, the pipe rack to support the fabric back drop, gas connection, glass, etc. The idea of the window display was to show how economically an oven controlled Roper range would operate. To do this, Mr. Goss removed the door panels from the oven doors on the range and inserted in their place plain window glass. They used plain window glass instead of Pyrex because of the transparency of the plain glass. Then a thermometer was placed inside the oven to show the temperature in the oven and the thermometer could easily be read through the glass panel in the door. The oven control was set at 250 degrees and a card down near the edge of the window told of this fact. Another card on the floor of the display window told that the thermometer also registered 250 degrees. Then in the broiling oven a mirror was placed on an angle so that passersby could see how low a flame was required to keep the oven temperature at 250 degrees. Then a gas meter was placed under the range showing the amount of gas which the burner consumed to maintain the 250 degrees temperature. The whole display, with the neat setting for the range, the Baby Ropers, the food products cards, the tie-up of the oven control, thermometer and low oven flame, made a very attractive and interesting display which created a great deal of comment.

Mr. Goss, general manager of the Chattanooga Gas Company, and Mr. C. E. Dougherty, new business manager, have turned in a very fine record in sales of merchandise this year.



STEAM FOR HEAT — GAS FOR FUEL



Most Stores and Factories Don't Open On Thanksgiving and Christmas

HOW *it's done by* CLOW

Clow Gasteam Radiators supply *real* steam heat, with all its advantages and none of the difficulties.

Because Clow burners are enclosed, the fire hazard is eliminated. Clow Radiators are approved by the Underwriters' Laboratories.

Little or no servicing is required on Clow Gasteam Radiators. They are solidly built, permanently attached, and cannot be accidentally upset.

Clow Radiators spread heat over a large area, as is necessary in almost all cases of commercial heating, rather than intense heat immediately surrounding the radiator.

Clow has been building Gasteam Radiators for 20 years. The annual sales are now bringing more than a billion cubic feet of *new* heating load to the gas companies each year.

Warehouse stocks are maintained at 21 distributing points.

The Clow Vented Radiators end the moisture problem that has held back gas heating in many sections of the country.

Our new Clow Gasteam Vented Catalog should be read by officials of Gas Companies, architects, steam fitters, plumbers and others interested in the proper venting of any gas appliance.

Write for your copy today.

The Thanksgiving peak, the Christmas peak, the New Year's peak—all leave, off peak valleys. Clow Gasteam can fill in between the peaks.

Shops, stores, offices, factories and public buildings heated with Clow Gasteam help to level the seasonal gas consumption. Clow Gasteam for commercial heating does not interfere with holiday loads because commercial heating is down on holidays. And the Gasteam *heating* load goes on all winter—every week day without adding to your peaks.

Clow Gasteam is well suited to the intermittent heating required in commercial places because freezing of the water in the radiators will do no harm.

JAMES B. CLOW & SONS
201-299 North Talman Avenue, Chicago

CLOW GASTEAM

A. G. A. and Underwriters' Laboratories Approved.

STOCKED IN EVERY SECTION OF THE COUNTRY

Natural Gas Field Being Investigated

One result of extensive development of the Laconta-Elizabeth gas fields in Harrison County, twenty-five miles west of New Albany, Ind., is the opening by the Louisville Gas and Electric Company of an oil well producing 50 barrels daily, which is more than any other ever drilled in the district for the past fifty years. The oil was struck while the company was drilling for gas.

Following the refusal of the Kentucky Pipe Line Company, which was an auxiliary of the Louisville Gas and Electric Company, to buy its usual 1,000,000 feet of gas a day for the city of Louisville from the Railroaders' Gas Company, which was sold to private persons at an auction sale at Corydon, Ind., recently, a large number of companies and private capitalists, including the Louisville Company, have entered the field to make an investigation of the gas situation.

Merger Certificates Filed

Certificates have been filed in the office of the Secretary of State by Edwin C. Redfern, attorney, 520 Union Trust Building, Rochester, N. Y., merging Sodus Gas and Electric Light Company, Marion Power Company, Northern Cayuga Light and Power Corporation with Lake Ontario Power Corporation.

Personals

H. R. Sterrett Elected President of Gas Company

It was announced by the board of directors of the Des Moines Gas Company that, at a meeting of the directors held October 4, 1927, H. R. Sterrett, formerly vice-president and manager, had been elected president of the company to succeed C. M. Benedict, resigned.

Mr. Benedict, who had been an official of the gas company for a period of five years, was granted a leave of absence last April to take up work with The United Gas Improvement Company as assistant to P. H. Gadsden, vice-president in charge of public relations. Since he is now permanently located in Philadelphia, Mr. Benedict resigned as president of the local gas company and Mr. Sterrett was elected to fill the vacancy, in line with the company's policy of having its chief executive a citizen of Des Moines.

Mr. Sterrett has been with the Des Moines Gas Company for the past eleven years and has successively filled the positions of engineer, manager and vice-president.

The local members of the board of directors are: B. F. Kauffman, J. G. Gamble, Alex Fitzhugh, J. M. Burrows, Wm. Koch and H. R. Sterrett.

J. J. Cagney Heads New Corporation

Jefferson J. Cagney, formerly manager of the General Engineering and Management Corporation, New York, has been made president of the Utilities Capital Company, Inc., a new finance and management corporation with offices in New York. Mr. Cagney has had a thorough training and a wealth of experience in the public utility field and has long been active in the affairs of the National Electric Light Association, the Illuminating Engineering Society and the American Gas Association.

F. W. Tewksbury Honored

F. W. Tewksbury, safety director of the Public Service Company of Colorado, represented Denver, Colorado, at the Sixteenth Annual Safety Congress recently held in Chicago.

Patten Severs Connection as District Manager

John A. Patten has announced that he has made arrangements to sever his connections as district manager of the Elkhart, Indiana, district of the Northern Indiana Public Service Company, effective November 1, to take up field work in the development of gas properties in the Middle West. He expects to maintain his residence in Elkhart until after the first of the year.

E. D. Anderson, of Hammond, Indiana, has been transferred from the engineering department of the company to become assistant manager of the Elkhart district, and will become manager on November 1. He is a graduate of Purdue University. Mr. Patten began his work in Elkhart in 1913.

F. E. Drake Gives Up New England Association Activities

Francis E. Drake has left New England to become connected with the Associated Gas and Electric Companies, and therefore has resigned his position of secretary of the Guild of Gas Managers. I. T. Haddock, of the Cambridge Gas Light Company, has been appointed to fill his unexpired term.

Mr. Drake has also resigned his position as vice-chairman and secretary-treasurer of the operating division of the New England Gas Association. L. E. Knowlton, of the Providence Gas Company, Providence, Rhode Island, has been elected to fill his unexpired term in that position.

Stotz Becomes Vice-President of Kerner Incinerator Subsidiary

Louis Stotz has become associated with the Kerner Incinerator Company organization of Milwaukee as vice-president of a new subsidiary company now being organized to manufacture a complete line of gas-fired incinerators for domestic use.

He will make his headquarters at 310 West 65th street, New York City.

Announcement will be made in due course concerning the corporate name of the new company and its product.

J. P. Van Hook, formerly of the Home Incinerator Company, of Milwaukee, will be associated with the sales organization of the new enterprise.

R. D. Lewis Appointed Director of Public Relations

George B. Evans, president of The Laclede Gas Light Company, has announced the appointment of R. D. Lewis as director of public relations of that company to succeed Vincent M. Carroll, who has resigned to become assistant to the president of the Southwestern Bell Telephone Company.

Lewis is a native Missourian, educated at the University of Missouri, and was in newspaper work in St. Louis, Mo., St. Louis and as Jefferson City correspondent for various metropolitan papers until he came to the Laclede two years ago as assistant to Carroll.

Runner Field Representative for Public Service Company of Chicago

R. K. Runner, former president of the Charles City, Iowa, Gas Company, which is now owned by the Public Service Company of Chicago, and since the consolidation, general manager of the Charles City plant, has been appointed field representative for the Chicago corporation, in addition to his other duties. George S. Nelson, for ten years with the local concern, has been made general superintendent in Charles City. Mrs. Laura Hall, for five years with the Charles City concern, has been made assistant to Miss A. E. Koerner, treasurer, in Chicago.

Warmth

With in-built gas heater which assures the needed warmth at breakfast hour on cold mornings before furnace fire gets started.

A-B
Unified
GAS RANGES

Life's necessity is warmth, and for it there is no substitute. The A-B Unified Range provides this essential to home comfort in addition to cooking and baking. Hence, it exerts a double appeal.

Sell A-B Unified Gas Ranges and you stimulate the general interest in other gas appliances, as well as increasing your profit per consumer.

Write for descriptive literature on Unified Ranges, and full details of our co-operative advertising campaign and sales stimulative.

A-B STOVE COMPANY
BATTLE CREEK, MICHIGAN

World's Largest Exclusive Manufacturer of Gas Ranges
Warehouses at San Francisco and Los Angeles

"There is no substitute for Warmth"

Trade News and Construction

U. G. I. Contracting Company's Activities

The Portsmouth (N. H.) Gas Company is preparing to make improvements in its plant and has contracted for a 5-foot carburetted water gas apparatus, together with a washer-scrubber, turbine-blower plant and the necessary auxiliary equipment for the apparatus.

The Fulton County Gas and Electric Company, Gloversville, N. Y., intends to remodel its purification system by the installation of a valve system to supplant the old center seal arrangement. Orders have been placed to do this work, which will consist of 12-inch welded steel overhead lines as well as 12-inch cast iron underground connections with the necessary valves and fittings.

The Certainteed Products Corporation has lately ordered one U. G. I. high duty condenser for installation at its York, Pa., plant.

The Brooklyn Borough Gas Company has placed the order and is preparing to install a U. G. I. tar extractor, which will have a daily capacity of 12,000,000 cubic feet. It will require 30-inch connections to serve this large unit.

Continued activity is reported in the sale and installation of the Cottrell Electrical Precipitation System for the removal of tar and other foreign matter from gas. Recent orders included a unit of 500,000 cubic feet capacity per hour for The Tampa Gas Company and a 1,375,000 cubic feet capacity per hour unit for Sloss Sheffield Steel and Iron Company, at Birmingham, Ala.

In addition to the extensive main and service laying work it is doing for the Connecticut Power Company, orders have recently been given to the U. G. I. Contracting Company to furnish, deliver and install approximately 1,100 feet of 4-inch welded steel main in the town of Cromwell

In the improvement of its Willimantic (Conn.) gas plant, the Rockville-Willimantic Lighting Company contemplates the installation of a U. G. I. high duty condenser and has given the order for the work. In addition to the condenser the U. G. I. Contracting Company will furnish and install all necessary connections and bypass for the equipment.

Latest orders for Smoot accumulators are from the Nassau and Suffolk Lighting Company for its Hempstead, N. Y., plant and the Georgia Power Company for its Atlanta plant.

The Key City Gas Company, of Dubuque, Iowa, has placed an initial order for the installation of the new U. G. I. intermittent chamber ovens. This equipment will consist of three type S benches of five ovens each, which will have a capacity of carbonizing approximately fifty-five tons of coal per day, and will be ready for operation early next year.

The Wisconsin Gas & Electric Company has also contracted for the installation of U. G. I. intermittent chamber ovens for its plant at Racine, Wis. This plant will be of the L-5 type and will have a daily carbonizing capacity of over 201 tons of coal or 2,470 M. cubic feet of 520 B.t.u. gas without steaming, or 2,676 M. cubic feet with steaming operation.

The installation at the Racine plant will include five benches, each consisting of five vertical ovens, with recuperators, waste gas flues and the necessary setting.

A ten-foot six-inch U. G. I. standard pressure producer, capable of gasifying 42 tons of fuel per day, will supply the producer gas for heating the benches.

Under the contract the U. G. I. Contracting Company will provide the hydraulic mains, take-off connections, pumps and other parts for the Racine installation. A U. G. I. waste heat boiler will likewise be installed.

Additional equipment includes a cyclonic dust arrester and firebrick lined producer gas connections.

Semet-Solvay Engineering Corporation to Install Acid Washer at Ford Plant Other Contracts Received.

The Ford Motor Company has just ordered an acid washer for the light oil and benzol recovery plant at Dearborn. This apparatus will be part of the by-product coke oven plant operated by the Ford Company. The washer will have a capacity of approximately 3,000 gallons. Its function will be to wash out impurities from the crude benzol liquor by means of a sulphuric acid bath. The process separates such substances as phenol and sulphur while preserving for further refinement the elements desirable for making high quality automobile fuel.

The Des Moines Electric Light Company has ordered a de-emulsifying unit for dehydrating tar to be installed in its plant at Oskaloosa, Iowa. The gas output is around 100,000 cubic feet daily and the de-emulsifier will separate from the emulsion and plant effluent the tar which it contains and render it in a merchantable condition. The process, which employs chemical reaction and heating, also leaves the waste liquids of the plant safe for disposal.

The Pennsylvania Power and Light Corporation, Williamsport, Pa., is installing a de-emulsifier unit at its plant here for the dehydration of tar. The installation is being made by the Semet-Solvay Engineering Corporation. The unit will separate the tar from the emulsions produced in making gas and dehydrate it to meet the market standard. Remaining liquors are neutralized by the action of the process so that they can be used at the plant or disposed of safely.

A de-emulsifier unit is being installed in the gas plant at Bay Shore, L. I. for the E. L. Phillips Company. This apparatus, which is the second one to be ordered by the Phillips Company for Long Island properties, is designed for the treatment of tar emulsions. It will handle the emulsion which is produced in the manufacture of 2,000,000 cubic feet of gas daily and by chemical action and the use of steam will separate the tar for the market and neutralize the remaining liquor so that it can be dispensed with safely. The first de-emulsifier to be purchased by this company is being installed at the Far Rockaway plant.

Two orders have been received for backrun installations on water gas machines operated by the gas companies in Massachusetts.

The Worcester Gas Light Company has ordered a backrun for an 11-foot machine at its plant. The new equipment will include a Steere 30-inch three-way valve and considerable plant piping. This is the second backrun to be put into service by the Worcester company.

The Pittsburgh Coal Gas Company has ordered a backrun for a 9-foot water gas machine. A 24-inch three-way valve will be installed as part of the equipment. One reason for putting in the new equipment is to enable the operators to use soft coal as generator fuel when desired.

Work Started on Office Building for Western Gas Construction Company

The Rust Engineering Company of Pittsburgh has been awarded the contract for the main office building of the Western Gas Construction Company at Fort Wayne, Ind. Work will be started immediately. The cost of the new building will be about $160,000. It will be ready for occupancy by the middle of February next year. The structure will be two stories of reinforced concrete and face brick with Indiana limestone trimming.

Western Gas Construction Company to Install Purifier Connections in Rio de Janiero

The Canadian and General Finance Company, Ltd., of Toronto has awarded contract to the Western Gas Construction Company for the building of 30-inch purifier connections for their plant in Rio de Janeiro, Brazil. The connections will consist of special and standard valves, steel pipe and welded steel fittings, all of which will be exported to Brazil for installation on concrete purifier boxes.

PRODUCT ...OR.. PRICE

WHICH IS MADE FIRST?

Today, as for the past 43 years, one definite policy guides the Roper organization in the pricing of its products. Every Roper Gas Range, every other appliance that is built in the Roper factory, is created to Roper's unswerving standards of quality—and priced afterward. Roper never has—and never will—allow quality to be sacrificed to price. Fortunately, for both retailer and consumer, the widespread and steadily increasing demand for Roper products makes possible a price level which is attractively low.

ROPER

TRADE MARK REG. U.S. PAT. OFF. REG. IN CANADA

GAS RANGES
GAS FURNACES

GEO. D. ROPER CORPORATION, Rockford, Illinois
Pacific Coast Branch: 135 Bluxome Street, San Francisco, California

George D. Roper Corporation Announce Changes in Representatives' Territories

The George D. Roper Corporation, in line with their policy to improve their service, have made an arrangement with Mr. J. C. Mansfield, who has traveled in the southwestern territory, to represent them in the State of Texas.

Mr. Mansfield will move and live and headquarter in Dallas. This will greatly improve the Roper service, and in conjunction with their warehousing plan will materially assist in the development of the gas business, particularly the appliance end in the Lone Star State.

Mr. Mansfield has served his previous organization fourteen years in the territory in the southwest and is thoroughly familiar with the gas appliance business.

Mr. W. F. Carrott, who has been associated with the George D. Roper Corporation for the last two years, will, in addition to the territory he has been serving, take on the southern Indiana territory which has been recently cared for by Mr. John F. Parker, one of the oldest gas appliance representatives.

The Roper Corporation have found it necessary, due to the expansion of their business, to appoint Mr. Parker as special representative and relieve him of the necessity of covering a special territory.

Gas Machinery Company to Install Six-Foot Water Gas Set at Newton, Iowa

The Gas Machinery Company of Cleveland, Ohio, has been awarded a contract for a new six-foot water gas set by the City of Newton, Iowa, to be installed in the Municipal Plant in Newton.

The contract includes motor-driven blower, generator charging equipment, oil pump, air and steam meters, pyrometer and scrubber with bypass.

This new water gas set will be erected in a new building which the city is furnishing and will enable the city to take care of its growing send-out and maintain their usual good service.

Order has been received for two seven-valve automatic controls for water gas sets which will be installed in the gas plant at Roulette, Pa.

The gas company at Atlantic Highlands, N. J., has placed order for two sets of breeze collectors for superheater stacks of water gas apparatus.

An order has been received to install three additional breeze collectors on the superheater stacks in the gas plant at Omaha, Nebraska.

A breeze collector was installed on one of the sets in Omaha a short time ago.

An order has been received from the gas company in Granite City, Illinois, for the installation of 30-in., 20-in. and 16-in. piping, valves and fittings for connecting the new purifiers now being erected by the Gas Machinery Company.

The new valves, piping and fittings will connect the new purifier plant with the gas lines of the coke oven plant adjoining with the metering equipment and with the compressor equipment and high pressure mains.

The gas company in Springfield, Mass., has placed an order for installing a breeze collector on one of the carburetted water gas sets.

An order for a cooling scrubber and cooling coils has been received from the gas company in Kewanee, Illinois.

This new cooling scrubber equipment will take care of the increased make of gas at Kewanee and includes the newest type of cooling coils made by The Gas Machinery Company.

An order has been received for silica inclined retorts and silica settings complete with fire clay recuperators and auxiliary equipment to be installed in the gas plant at Charlotte, N. C.

The Gas Machinery Company installed the original inclined retort installation in Charlotte, N. C.

Contract for a new water gas set and auxiliary equipment to be installed at the gas plant at Danville, Virginia, has been received.

The contract includes a seven-foot carburetted water gas set with connections and charging floor, generator charging equipment, and blast apparatus, also a water gas condenser, P. & A. tar extractor, and yard piping.

The gas company is adding to their existing buildings and also installing new boilers and other equipment in order to take care of the increased demand for gas and continue the good service they have always given in the past.

Contract for Ten Billion Feet of Gas Closed by International Combustion Engineering Corporation

A revolutionary industrial step is reflected in the announcement of the signing of a contract by the Public Service Corporation of New Jersey for the purchase of a minimum of ten billion feet of gas during the next ten years from International Combustion Engineering Corporations' new low temperature coal carbonization plant to be erected at New Brunswick, N. J.

This plant is the first of International Combustion Engineering Corporation's construction of the kind in this country, the process having been in successful commercial operation for several years at Essen, Germany, where thousands of tons of coal have been distilled and the products marketed. This plant will handle approximately 250,000 tons of bituminous slack coal per year through the initial installation of the eight units. In addition to the gas which is a by-product the plant will produce six million gallons per year of coal tar, which has all been contracted for by the F. J. Lewis Manufacturing Company of Chicago; one million two hundred and fifty thousand gallons of crude motor spirits, which is said to be higher in power than the present blended gasoline.

There will also be produced from the coal tar of this plant 2,750,000 gallons per year of the heavier distillates which will find their way into the business of wood preservatives, the manufacture of disinfectants, flotation oils and plastics.

There will be marketed from this plant after the coal is distilled and all of the valuable by-products taken from it approximately 175,000 tons of a domestic smokeless fuel possessing all of the advantages of anthracite with none of its disadvantages such as high ash, of a value of over $1,750,000 a year.

The P. H. & F. M. Roots Company Announce Changes In Sales Personnel

Recent changes in the sales organization of the P. H. & F. M. Roots Company are of interest to the gas fraternity.

William S. Guitteau has been appointed Eastern district manager to succeed H. M. Papworth, who has retired from active service. Mr. Guitteau is also in charge of export sales.

Albert E. Lloyd, who has been identified with the New York office for a number of years, has been appointed assistant Eastern district manager.

The Chicago office has been placed in charge of Bowen T. Ehrnman, formerly with the West Gas Improvement Company.

Both Mr. Guitteau and Mr. Ehrnman, although associated with the Roots Company but a short time, are not strangers to the gas field as both are well and favorably known through a long association with gas plant construction and gas manufacture.

Charles City Gas Company Purchased

The Federal Public Service Corporation of Chicago has purchased the Charles City, Iowa, Gas Company, and R. K. Runner, who has been manager of the plant since 1909, will continue in that position. Mr. Runner and a group of Freeport, Illinois, men organized the company with support of Charles City financing. Mr. Runner has held controlling interest and has been president of the company several years.

ELEVATOR MAKERS TO THE FELLOWS WHO GET THERE

A sample:

Standard Oil Co.	International Harv. Co.	Remington Typewriter Co.
Cluett, Peabody & Co.	Standard Underground Cables Co.	Lehn & Fink Co.
H. J. Heinz Co ("57")		Procter & Gamble Co. (Ivory Soap)
Crane & Co. (Dalton)	John Wanamaker	
Packard Motor Car Co.	John Morrell & Co.	E. I. Du Pont de Nemours & Co.
Swift & Co.	Christie Brown & Co. (Toronto)	
United Gas Imp. Co		United States Gov't
Larkin & Co. (Buffalo)	Firestone Tire & Rub. Co.	Sears, Roebuck & Co.
General Electric Co.	Consolidated Gas Co. (N. Y.)	United States Steel Co.
Penn. R. R.		Westinghouse Elec. Co.

Here are some **2 dozen of the 3000 reasons** we laugh our heads off when the man with a factory and steam or compressed air fails to

"HOOK 'ER TO THE BILER."

Talk about a rabbit's foot!

Well ask "Old Jim" and the men who have to keep the works a movin' and who have to get the goods out and make the plant make money.

Well, we guess so!

Up among the Pennsylvany Dutch when a man does an unwise thing they say

"I wouldn't think he'd be so dum a'ready!"

We are equipping the finest plants all over this land **AND EVERY MOTHER'S SON IS MAKING MONEY.**

Hundreds cheaper and Thousands better when you

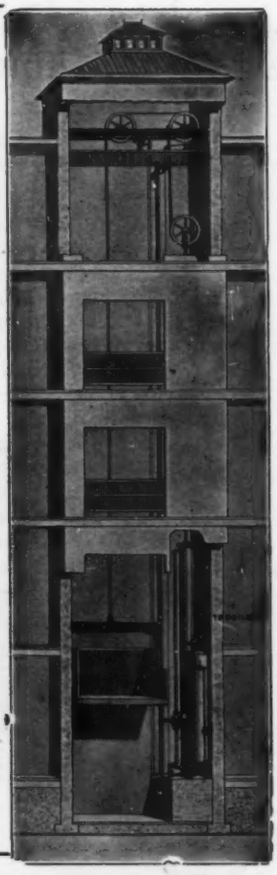
"HOOK 'ER TO THE BILER"

Craig Ridgway & Son Co.

Over 3,000 in daily use. COATESVILLE, PA.

Double Geared

Direct Acting



SUPERIOR

Gas Meters
Provers
Service
Cleaners
Diaphragms

SUPERIOR METER CO.
167 - 41st Street
Brooklyn, N. Y.

Completely Automatic Control with the Minneapolis Means:

Fewer Service Calls on Gas Heating Installations

Experience proves that dependable automatic control is a vital factor in reducing service expense on gas heating installations. With the Minneapolis clock-type thermostat, the heating plant requires practically no attention after your service man lights the pilot in the Fall. There's no temptation to tamper. Difficulties due to ignorant or careless handling of equipment are reduced to a negligible quantity. The Minneapolis meets every ordinary situation in the operation of the heating plant—automatically.

Precision-built Minneapolis Controls also minimize service troubles with the regulating equipment itself. The Minneapolis thermostat is remarkably accurate. The Minneapolis clock — providing warm rooms to dress in, and separating the heating-up period from the breakfast cooking load—is completely built in the Minneapolis model clock factory. A high-grade, dependable timepiece.

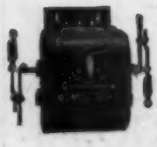
And if anything does go wrong, you have the backing of one of the most efficient service organizations in the heating industry. Branch offices and distributors in principal cities. Over 2,000,000 people are enjoying the benefits of Minneapolis controls. Write for new folder.

Minneapolis Heat Regulator Company
Established 1885
408 E. 28th St. Minneapolis, Minn.

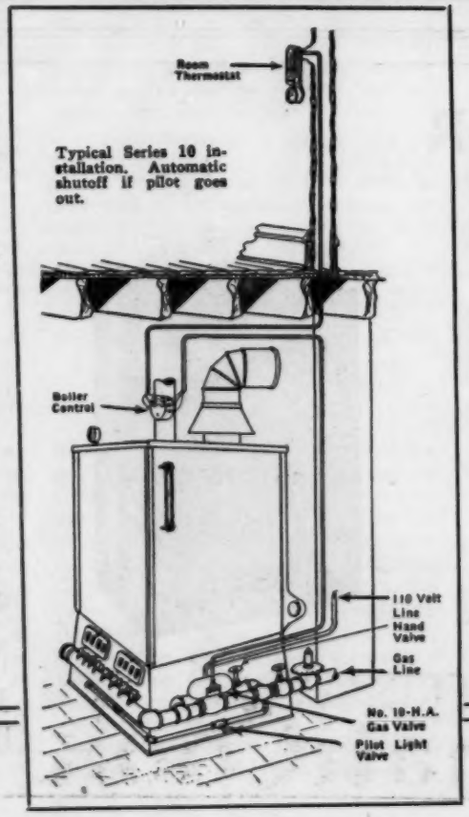
The "MINNEAPOLIS" HEAT REGULATOR

Minneapolis Limit Control. A safety device for furnace or boiler, providing protection against excessive temperatures or pressures.

Minneapolis Magnetic Gas Valve



Minneapolis Electric Motor, universally applicable to all types of boilers, furnaces, and conversion burners.



Ready Now

The New AutomatiCook Book --- for which thousands of women have asked....

Hundreds of stove dealers have asked us for it. They felt that as makers of so famous an oven heat controller, we could produce the kind of a book the housewife needed. *Here* is the all-inclusive volume . . . A cook book that tells not only *what* to cook—but *how* to cook—how to prepare hundreds of appetizing, hunger-appeasing things in the surest, easiest way, with the AutomatiCook.

A special proposition for Gas Companies and Stove Dealers

This book carries a price mark of 50c. and compares well with independent publications selling for a dollar or more. We want you to know the special low prices that we have established for Gas Companies and Stove Dealers. Your signature on the coupon will bring this information promptly.

Backed by National Advertising in leading Publications

Robertshaw Publicity in such magazines as the Ladies Home Journal and Good Housekeeping advertises this book to millions of housewives. Remember, many who send for it will not be AutomatiCook users, which means that this book is preparing a market for every manufacturer and seller of Gas Ranges equipped with AutomatiCook.

ROBERTSHAW THERMOSTAT CO.
YOUNGWOOD, PA.

ROBERTSHAW
TRADE MARK
AutomatiCook

ROBERTSHAW THERMOSTAT CO.
Youngwood, Pa.

Please send me complete data and special dealer's prices on the new AutomatiCook Book.

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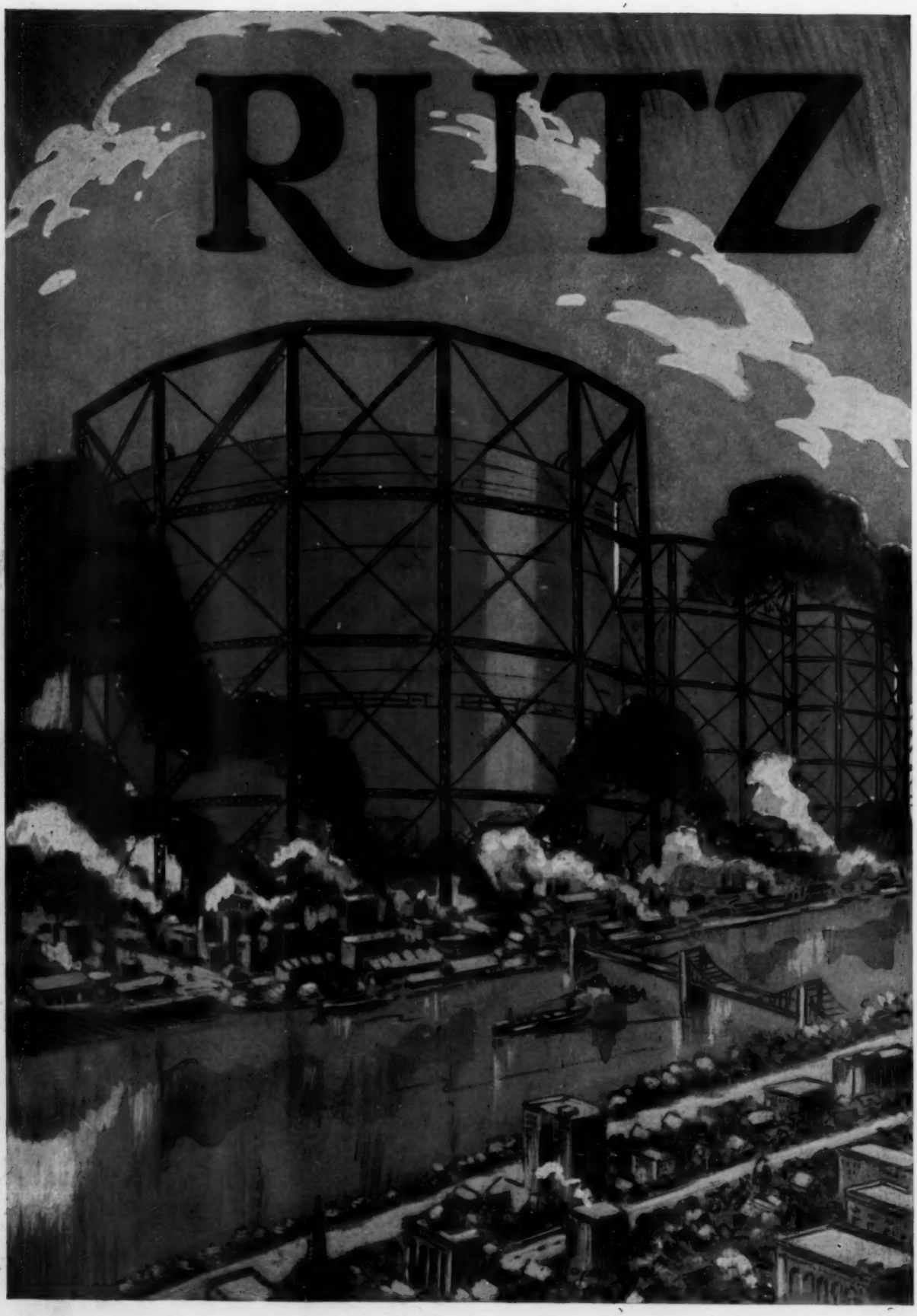
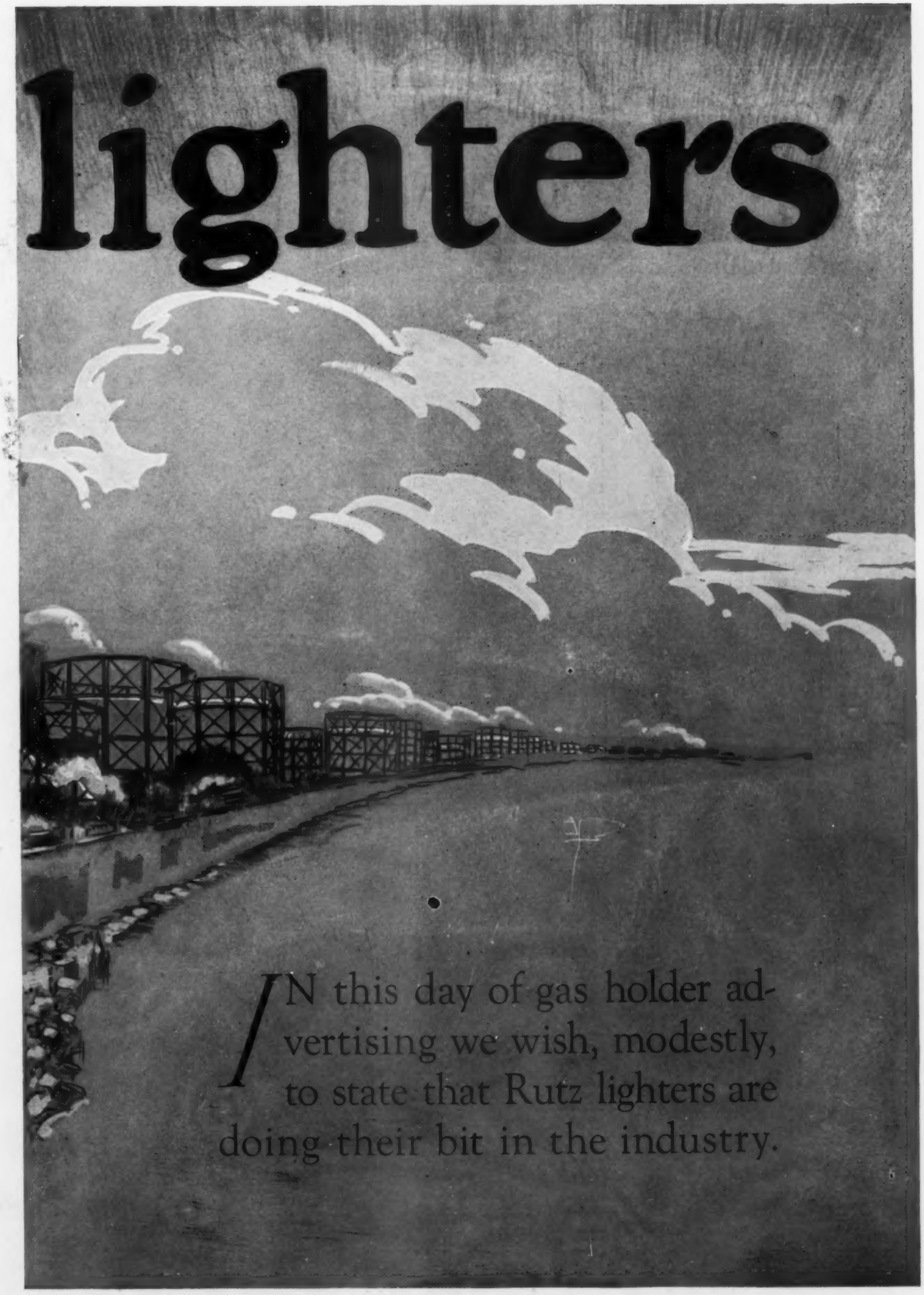

RUTZ


lighters
IN this day of gas holder advertising we wish, modestly, to state that Rutz lighters are doing their bit in the industry.

4 1/2 Miles per Day

Savings *by* Smith

The Smith patented method of electric welding of the longitudinal seam makes possible the production of pipe from 16 to 22 inches in diameter and 30 feet in length of *uniform* length, diameters, and wall thicknesses.

Fewer Joints

Smithsteel Pipe is made plain end and plain end beveled for any field joint. The 30-foot lengths of Smithsteel Pipe will require only 175 joints to the mile as compared with 262 needed for the usual 20-foot lengths of pipe.

Joining Simpler

Smithsteel Pipe is accurate in both outside and inside diameters. The wall thicknesses are uniform. The joints will butt up evenly at all points making alignment and either welding or coupling simpler and surer. Joining will therefore be quicker and easier.

The Use of Less Metal

Due to the Smith method of fabricating and the high quality steel, less metal can be used in the body of the pipe.

As Specified

4 1/2 miles—23,760 feet—of 16 to 22 inch Smithsteel Gas Line Pipe is coming out of the A. O. Smith Pipe Mill per Day, as shown in the Production Photograph above.

Every foot, is accurate in outside and inside diameters, as specified. Every foot, is uniform in wall thickness, as specified. Every length is exactly 30 feet.

Smithsteel Gas Line Pipe saves on transportation costs, and joining in the field, as explained in the "Savings by Smith" column.

For complete information address:

A. O. SMITH CORPORATION, *Milwaukee, Wis.*
Oil Field Products Division Los Angeles

SMITHSTEEL
GAS LINE PIPE

From a 3 room cottage *to* the largest building

An Ideal Gas Boiler for every heating need

WHETHER you are heating your factory, your office building, or your home, there's a proper Ideal Gas Boiler to give you absolutely automatic, care-free heat.

Or you will find that an Ideal Gas Boiler will furnish low-pressure steam or hot water for a wide variety of industrial and commercial uses.

Where reliability and uniformity of heat supply are paramount, Ideal Gas Boilers are particularly necessary and economical.

In your home, your Ideal Gas Boiler eliminates all noise, dirt, odor, labor. No ashes to haul out. No oil tank to install. No electrical hook-up to get out of order. Your heat comes steadily—as you need it—by pipe line from your gas company's holder.

Write today for full information—keep abreast of this *modern* heating method!

LET US HELP YOU SOLVE YOUR PARTICULAR HEATING PROBLEM.
CLIP THE COUPON FOR FULL INFORMATION.

AMERICAN GAS PRODUCTS CORP.
376 Lafayette St., New York City, N.Y.

Gentlemen: I am interested in Ideal Gas Boilers for the uses checked below. Please send me full information. IG 1

☐ Plant heating ☐ Low-pressure steam for industrial use

☐ House heating ☐ Hot water supply

Name.....

Address.....

IDEAL GAS BOILERS

Product of the AMERICAN RADIATOR COMPANY

American Gas Products Corporation

376 Lafayette Street DISTRIBUTORS New York

BITUMASTIC ENAMEL used to protect 68 miles of steel lines laid by the Jersey Central Power & Light Corp.

The People's Gas Company, Glassboro, N. J., has protected 25 miles of steel mains with BITUMASTIC.

This 12-inch line has been coated with BITUMASTIC ENAMEL by the Consumer's Power Co. of Pontiac, Mich.

18-inch High Pressure line being protected with BITUMASTIC ENAMEL for the Long Island Lighting Company.

Twenty miles of 6-inch pipe protected with BITUMASTIC ENAMEL for the Detroit Edison Company.

The Public Service Company of Northern Illinois insures the life of 4-inch pipe with BITUMASTIC ENAMEL

BITUMASTIC ENAMEL used to assure a lifetime of uninterrupted service for the Northern Indiana Public Service Co.

The U. G. I. Contracting Company has also selected BITUMASTIC ENAMEL for the protection of steel gas mains.

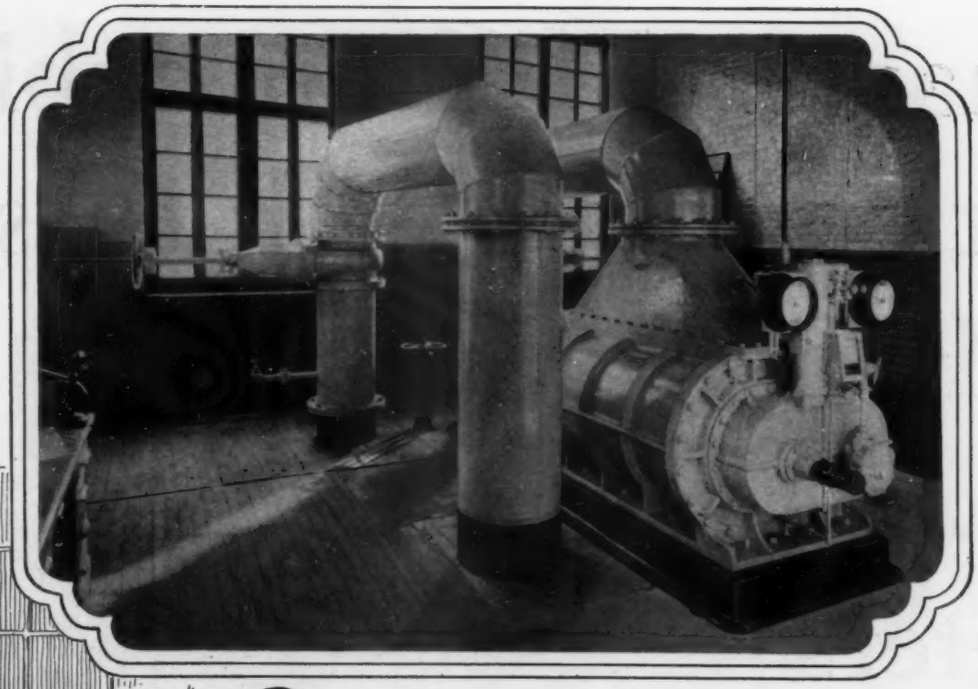
Realizing the tendency towards increased pressures, gas companies throughout the country are preserving the full strength of their steel lines for many years to come by the timely application of—

BITUMASTIC

Write for our complete book—"The Protection of Pipe Lines"

Wailes Dove-Hermiston Corporation
Whitehall Building, New York

Philadelphia Cleveland Chicago Tulsa San Francisco



Extreme Accuracy

The capacity of each Roots Meter that leaves our plant is checked in our own laboratory and the volume as shown by the Roots Direct Reading Volume Integrator is corrected to give accurate results.

Refinements in design, highly accurate machining and careful erecting have reduced the percent of error in Roots Positive Displacement Meters to an amount that comes well within the accepted variations of other types of machines.

Let your next meter be a Roots for Roots Meters eliminate all guesswork on the sendout or make.

The P. H. & F. M. ROOTS CO.

CHICAGO
Peoples Gas Building

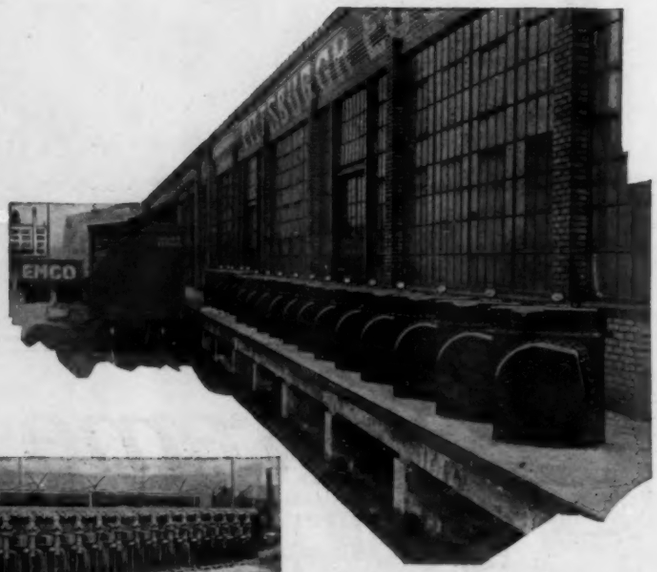
CONNERSVILLE, INDIANA

NEW YORK
120 Liberty Street

ROOTS

Kreuzer

Quarter Million cubic feet per hour with these EMCO No. 5 Meters



The EMCO Number 5 is a pressed steel large capacity dry meter

PITTSBURGH EQUITABLE METER COMPANY
PITTSBURGH, PA.

BRANCH OFFICES
New York, New York.
Chicago, Illinois.
Dallas, Texas.
Los Angeles, Cal.
Tulsa, Oklahoma.
Seattle, Washington.
Columbia, S. Carolina.
Salt Lake City, Utah.
Kansas City, Missouri.

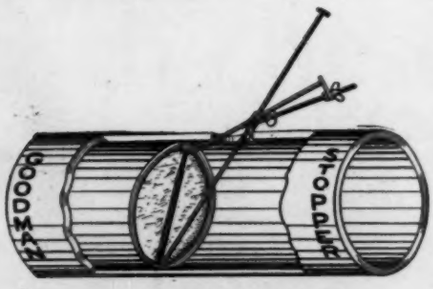
The above shows an installation of 48" plain end cast iron pipe connected with Dresser couplings. This installation has proven to be superior to all other types. The line has been in operation for some time. It is absolutely tight and has been unaffected by vibration or expansion and contraction. The couplings are equipped with lead tipped gaskets.

S. R. DRESSER MFG. CO.
BRADFORD, PENNA.

DRESSER
Couplings Dominate

Used since 1897

The two views show GOODMAN STOPPERS securely locked in a 30-inch pipe.



GOODMAN STOPPER

GOODMAN STOPPERS can be used in tight quarters

Work is being done in a crowded business street

SAFETY GAS MAIN STOPPER CO.

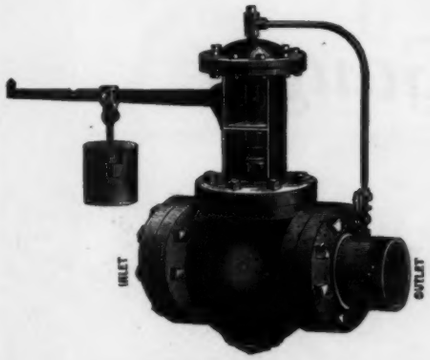
PATRICK GOODMAN, Owner

523 Atlantic Avenue

BROOKLYN, NEW YORK

Cable Address: Gastopper, N. Y.

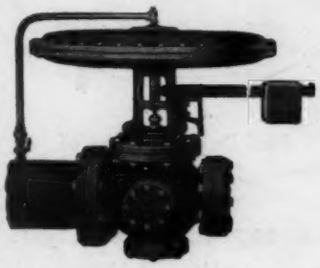
Efficient Regulation



The Fulton
High Pressure or Reducing Regulator

EFFICIENT regulation depends upon the accuracy of the regulation equipment. For 35 years the Chaplin-Fulton Manufacturing Company has made regulating devices for the gas industry. That the aim to make the most accurate and reliable equipment possible has been reflected in the Chaplin-Fulton series of regulators, is evidenced by their popularity and standing with the foremost gas companies.

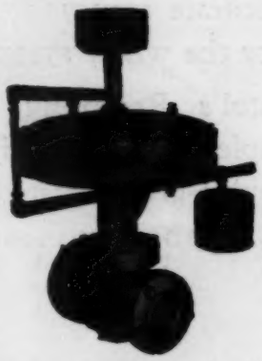
For an investment in efficient regulation, the following Chaplin-Fulton Regulators offer you the most that can be built into devices for these purposes.



The Fulton
Low Pressure Regulator

High Pressure Regulators
Low Pressure Regulators
House Regulators
Illuminating or Dead Weight House Regulators
House Service Regulators - - - Spring Style
High Pressure Spring Regulators
Little Hercules High Pressure Regulators
Gas-Fuel Boiler Governors
Gas Relief Valves
Duplex Sensitive Gas Governors
Back or Check Pressure Regulators

Write for information and Catalogues



The Fulton
Sensitive Gas Governor

The CHAPLIN-FULTON MFG. CO.
28-40 Penn Avenue **Pittsburgh, Pa.**

BRISTOL'S

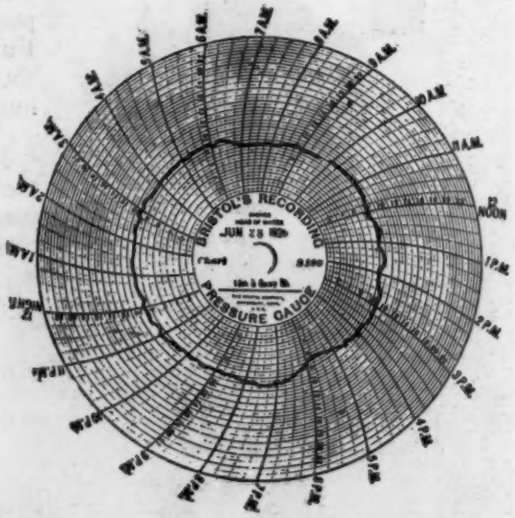
Recording Pressure Gauges

Provide a daily "chart record" report of district gas pressures

It takes but a moment to glance over each chart and know exactly what pressure was held, yesterday afternoon or last night, at any section in the distribution system.

Should complaint of low pressure be received it is a simple matter for you to refer to the chart of the district in question and quickly determine the justice of such complaint.

Recording Pressure Gauge
Model 11



A Full Day's Record of Pressures

The Minneapolis Gas Light Company, Minneapolis, Minn., has 39 Bristol's Recording Pressure Gauges installed in various sections of the city. The charts collected each morning constitute an accurate survey of pressure conditions for the whole system.

The Bristol's Recording Pressure Gauge is simple, rugged and singularly free from trouble-giving parts. In fact it requires nothing but routine attention.

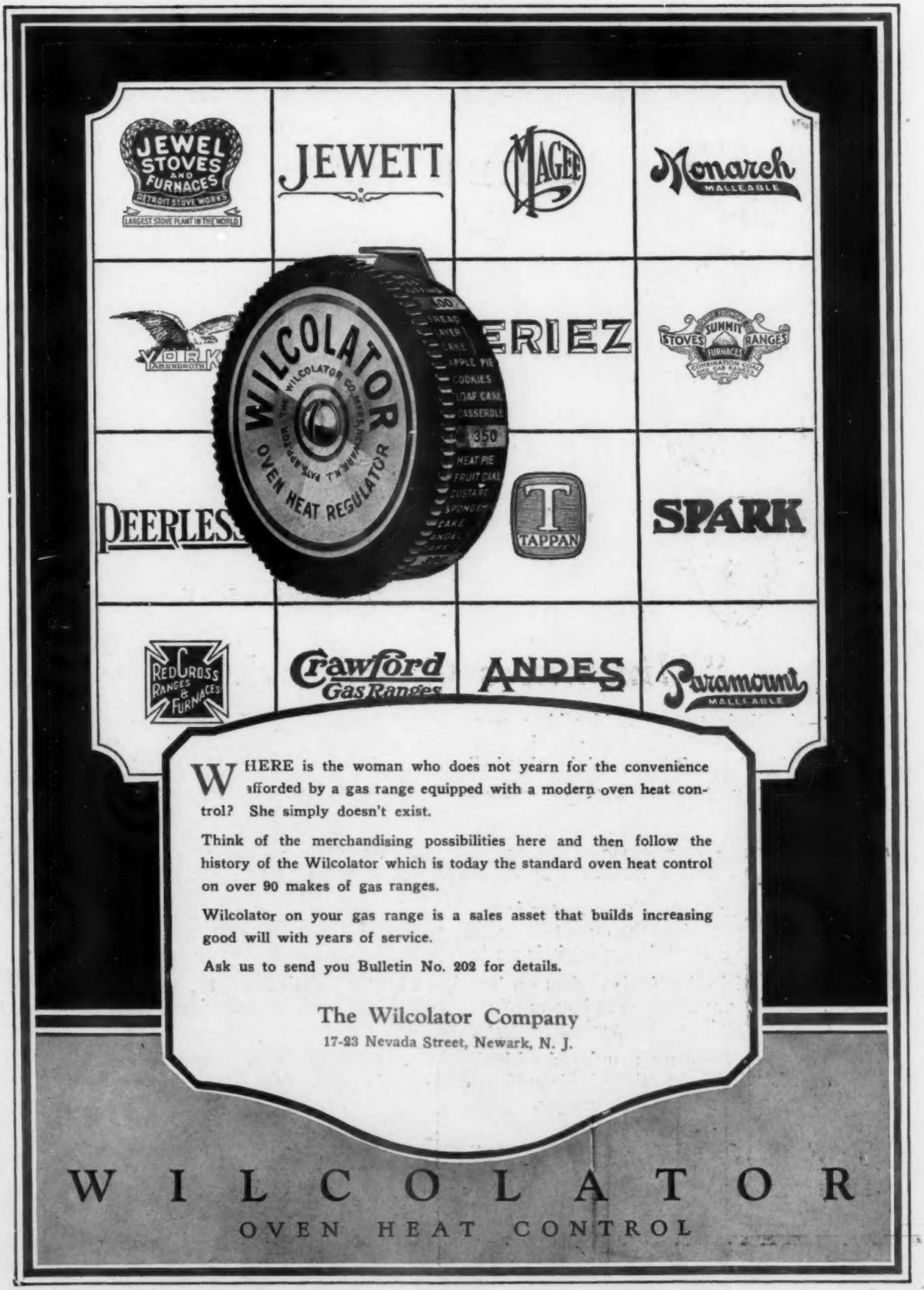
Write for new Gas Bulletin No. 357.

BRANCH OFFICES
Boston
New York
Philadelphia
Pittsburgh
Birmingham

The Bristol Company Waterbury, Connecticut

FOR 38 YEARS MAKERS OF
BRISTOL'S RECORDING INSTRUMENTS

BRANCH OFFICES
Detroit
Chicago
St. Louis
Denver
San Francisco



WHERE is the woman who does not yearn for the convenience afforded by a gas range equipped with a modern oven heat control? She simply doesn't exist.

Think of the merchandising possibilities here and then follow the history of the Wilcolator which is today the standard oven heat control on over 90 makes of gas ranges.

Wilcolator on your gas range is a sales asset that builds increasing good will with years of service.

Ask us to send you Bulletin No. 202 for details.

The Wilcolator Company
17-23 Nevada Street, Newark, N. J.

W I L C O L A T O R
OVEN HEAT CONTROL

STYLE B

(Actual Size)

Interchangeable with heat control.

FEATURES

of New Styles A and B

Shows actual Fahrenheit degrees.

Quick-acting thermostatic metal registers correct temperature immediately.

Extreme heat cannot injure or make the thermometer inaccurate.

Style B interchangeable with heat controls.

Carefully calibrated.

Porcelain enamel dials in two colors.

Accuracy guaranteed for the life of the oven.

No glass or mica to get broken.

Economical in price.

Handsome in appearance, add greatly to the looks of any oven.

Nickel or Porcelain Enamel Cover

"Eliminates Guesswork"

"—it eliminates a considerable amount of guesswork in getting the correct temperature of the ovens and, in connection with cooking receipt guides or cooking charts, it is our opinion that indicators such as you make are invaluable."

Extract of letter from a prominent concern in Ohio manufacturing a well-known brand of stoves and ranges, referring to

THE COOPER OVEN THERMOMETER

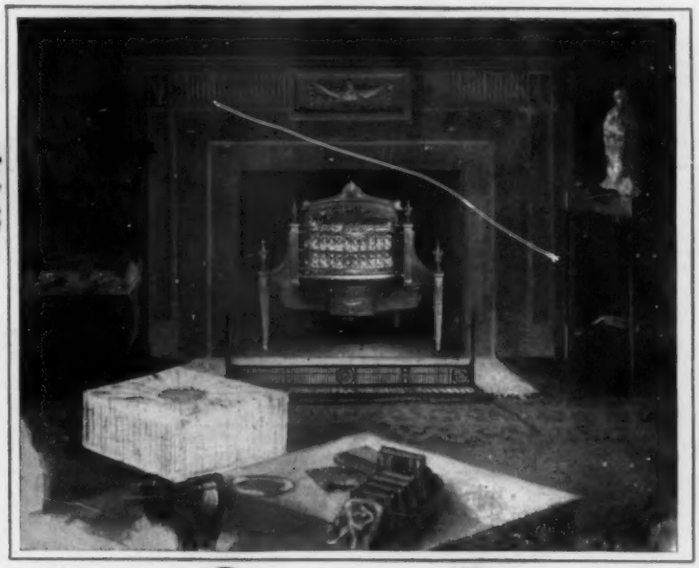
The Cooper Oven Thermometer is really a visible heat control, because it is so easy to regulate the oven temperature through its accurate and reliable indications, and for this reason it is an indispensable adjunct to every gas range.

Successful baking is dependent on intelligent heat regulation and the womenfolk, who are the largest buyers of gas ranges, are keen to appreciate equipment that will assure perfect baking results.

Therefore the ranges equipped with the Cooper Oven Thermometer are bound to sell. "A word to the wise is sufficient" — *Equip and insist* on Cooper Oven Thermometers on *all* gas ranges.

THE COOPER OVEN THERMOMETER COMPANY

4 MAIN STREET (Established 1885) **PEQUABUCK, CONN.**



No. 112

No. 65

No. 60

No. 102

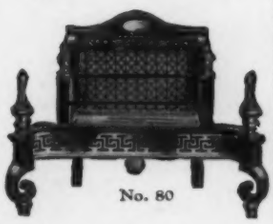
No. 85

No. 45

No. 30

No. 25

No. 115A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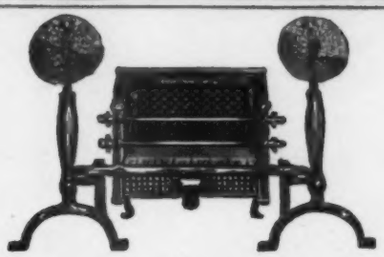


Radiantfire Model No. 90

Christmas is Radiantfire Season

Plan now for "the Christmas rush." The Humphrey Radiantfire is always popular at that season of the year because it is a gift of warmth and comfort for all the family. We want to suggest that you begin to plan your Christmas displays now and build them around a Radiantfire in a cozy living room.

More than that, we are continuing to send customers into your store by our extensive national advertising. The Humphrey Radiantfire is being used in more than a million homes today. As a Christmas present suggestion it offers a sales opportunity you cannot afford to lose.

There is a Humphrey Radiantfire for every type of room, to match every decorative scheme and to fit every price requirement—from authentic period models and the Humphrey Radiantfire Mantel to small portables for chilly, little used rooms. Get ready now to enjoy the biggest, most profitable Christmas business you have ever known.

The HUMPHREY Radiantfire

TRADE MARK REG. U.S. PAT. OFF.

GENERAL GAS LIGHT COMPANY, KALAMAZOO, MICH.

New York - 44 West Broadway San Francisco - 135 Bluxome Street

The COPPER KOMPAK

There are always some people who want the best. For them the Kompak represents all that m o n e y can buy. Everlasting materials, extremely low operating cost, perfect safety.

Unprecedented Success shows that it pays to build *up* to an ideal, not *down* to a price.

The KOMPAK COMPANY
New Brunswick, New Jersey

Just One Second

From Molten Metal to

BETWEEN the ticks of your watch, modern machinery converts a pool of molten metal to a length of MONO-CAST PIPE

One second the molton iron lies still in the bottom of the sand-lined mold. The next, the mold is spinning at high speed. Within the mold, centrifugal force has distributed the molten metal evenly, over the sand-lined walls. A MONO-CAST PIPE has been molded---and as a unit.

This simultaneous molding prevents casting strains. The sand-lining prevents chilling. The result is a fine-grained, dense, homogeneous structure, which resists impact and bends without breaking.

More than 2,500,000 feet of Mono-cast pipe are now in service.

AMERICAN CAST IRON PIPE COMPANY
BIRMINGHAM, ALA.

ACIPCO MONO-CAST CENTRIFUGAL PIPE
BELL AND SPIGOT

When You Paint For

Protection

Look For Three Things

1. *Water-tightness*
2. *Air-tightness*
3. *Permanence*

Then consider the reasons why Dixon's Silica-Graphite Paint possesses these characteristics in the highest degree.

To start with, the very nature of graphite makes it water resistant. Water slips off a graphite film as surely as off a duck's back.

This silica-graphite coating is airtight because the natural flat scales of this pigment overlap to form an unbroken skin.

And during the more than 65 years this paint has been on the market many records have been received where the protective coating was still effective after even 10 or 12 years.

Write for Booklet 231-B and Color Card.

Joseph Dixon Crucible Co.

Jersey City, N. J.

D X N TRADE MARK

1827 - - - - *One Hundredth Anniversary* - - - - 1927

14" deLavaud Line at Loredo, Texas

deLavaud Centrifugal Cast Iron Pipe in large diameters

OVER two and three quarter million lengths of deLavaud centrifugal pipe are now installed, in diameters from 4" to 20".

The many satisfied users find that the ease of handling deLavaud pipe is particularly true in the larger sizes—on account of its self centering bell, and its lighter weight which, of course, is proportionately greater as the size of the diameter increases.

Write for special literature covering the manufacture and use of deLavaud centrifugal pipe.

United States Cast Iron Pipe and Foundry Company

General Offices:
Burlington, New Jersey

SALES OFFICES

Philadelphia: 1421 Chestnut St.
Chicago: 122 So. Michigan Blvd.
Birmingham: 1st Ave. & 20th St.
Buffalo: 957 East Ferry Street
Cleveland: 1150 East 26th Street
New York: 71 Broadway
San Francisco: 3rd & Market Sts.
Pittsburgh: 6th & Smithfield Sts.
Dallas: Akard & Commerce Sts.
Kansas City: 13th & Locust Sts.
Minneapolis: 6th St. & Hennepin Ave.

WELSBACH STREET LIGHTING MAINTENANCE GAS---ELECTRIC

WELSBACH STREET LIGHTING COMPANY OF AMERICA

BAROMETERS

PHILADELPHIA, THE WORKSHOP OF THE WORLD, has 14,000 Manufacturing Establishments of which many have World-Wide Reputations.

"PRINCO" STANDARD FORTIN MERCURIAL BAROMETERS

are in World-Wide use because they, too, have a "World-Wide Reputation"

THEY ARE GOOD BAROMETERS
THEY ARE REASONABLE IN PRICE!

For more than a decade they have been made in such manner that they can be shipped safely and successfully wherever there is a common carrier. This has been recognized as an achievement in Barometry.

PRECISION THERMOMETER & INSTRUMENT COMPANY
1439 BRANDYWINE STREET - - - - - - PHILADELPHIA, PA.

Cutting the Mile in Two

With

DOUBLE LENGTH "NATIONAL" PIPE

IN the laying of this 18-mile line of 12-inch double random length "NATIONAL" Pipe there was a considerable saving of time, labor and joint making materials, due to eliminating approximately one-half the number of joints. Another advantage was that the possibility of leakage was greatly reduced and an all around better line obtained.

"NATIONAL" is the only pipe made in double random lengths and, aside from this feature, it is especially desirable for gas lines because of its high tensile strength, uniform structure and good welding qualities—assuring a strong, sound, dependable line from end to end.

Ask for "NATIONAL" Bulletin No. 26

NATIONAL TUBE COMPANY, PITTSBURGH, PA.

District Sales Offices in The Larger Cities

"In the Heart of Cleveland"

AUDITORIUM HOTEL

EAST 6TH AND ST. CLAIR AVE.

TO THE PUBLIC:

Are you wondering why we have built "Another" Hotel in Cleveland. One must have a good reason for spending nearly two million dollars. We have a reason worth far more than that.

Every hotel operator gives "His best efforts for your comfort." We have centered our efforts around one ideal desire, "To make you happy."

There must be something back of that desire. You can easily prove it by coming here just once.

Sincerely yours,
James L. Smith
Manager

Our Service Makes You Happy

AMERICAN GAS FURNACES

Help Trans-Atlantic Flyers

"All of the furnaces and ovens used for heat-treating and processing various parts of our Wright Whirlwind engines (used by Lindbergh and Chamberlin) were made by the American Gas Furnace Co."

(Abstract of letter from Wright Aeronautical Corporation)

The result of half a century of building FURNACES AND EQUIPMENT

For: Hardening, Annealing, Case Hardening, Tempering, Coloring, and for all Industrial Heat Treating Operations.

AMERICAN GAS FURNACE CO. PIONEERS IN 1878 LEADERS TODAY

Results are Quick Certain — Economical

Bulletin A G - 20 on request

American Gas Furnace Co.
Elizabeth, N. J.

(Patented)

Clark Industrial Burner Tips

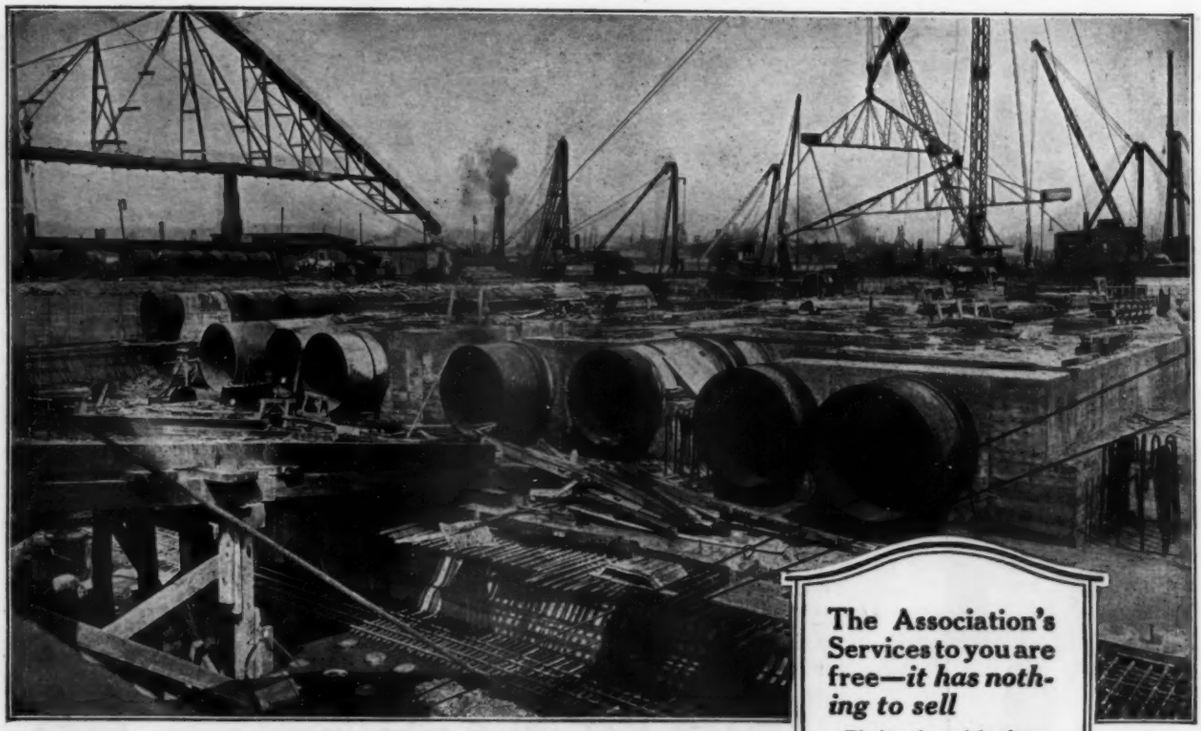
These tips for low pressure fan blast systems will outlast the life of metal tips many times.

Made in 15, 30, and 45 cubic foot capacities, to fit respectively ¾", 1", and 1¼" standard reducing couplings.

These tips lend themselves to a wide variety of industrial burner applications. Further information will be gladly supplied on request.

American Lava Corporation
29-59 William St.,
Chattanooga, Tennessee

Manufacturers of Lava Tips and heat-resistant Insulators



Thos. E. Murray Inc., Consulting Engineers

Imbedded in the foundation, it must last forever

The New York Edison Company, knowing they will not have the slightest worry or trouble with Cast Iron Pipe—ever—have imbedded it in the concrete foundations of their new plant, located on East 14th Street.

THIS impressive installation is further proof of the confidence with which engineers regard Cast Iron Pipe, where permanence is a prime factor.

These pipes carry condenser water which makes them subject to more corrosive action than either ordinary water or gas mains. In the circumstances, cast iron was the only material that could be considered.

There is no case on record where Cast Iron Pipe has failed under usual service conditions.

THE CAST IRON PIPE RESEARCH ASSOCIATION
People's Gas Building, Chicago, Ill.

The Association's Services to you are free—*it has nothing to sell*

The functions of the Association include:

Collecting and compiling data with reference to cast iron pipe and fittings for all purposes.

Assisting engineers in solving difficult and unusual problems.

Educating the public by institutional advertising in national mediums, to the manifold advantages of having an up-to-date waterworks.

Engineers, municipal officials and contractors are invited to write for special literature on the subject of water systems.

There is an especially valuable article on the "two mains system." Send for a copy.

BELL *and* SPIGOT JOINT—*the accepted standard for underground construction.*

CAST IRON PIPE

—In continuous service for over 250 years

Repairs as Good or Better Than
the Original Construction
by using

HYTEMPITE

(Reg. U. S. Pat. Off.)

The Standard of Comparison in High Temperature Cements

Retorts, Jamb Joints, Furnace Walls, Arches and Baffles are quickly and efficiently repaired with HYTEMPITE either by hand or with the Quigley Gun.

HYTEMPITE is used by hundreds of Gas Companies for laying up firebrick, and (mixed with crushed old firebrick or Ganisand) for patching and repairing refractory linings, making special shapes and tile, etc.

Keep a drum of HYTEMPITE on hand for quick repairs.

Quigley Furnace Specialties Co., Inc.

26 Cortlandt St. **New York**

Prompt Service—Stock in all Industrial Centers.

Stawite FLOOR SAVERS

UNDER THE FEET OF GAS STOVES, GAS WATER HEATERS and GAS REFRIGERATORS

They protect floor coverings and hardwood floors against the damage caused by the weight concentrated on small iron feet. Made of White Porcelain. —low in price and attractive in appearance.

The **Electric Porcelain & Manufacturing Co.**
TRENTON, NEW JERSEY

SEND FOR SAMPLES

"SAND-SPUN"

(TRADE MARK)

CENTRIFUGAL

(NEWEST PROCESS)

CAST IRON PIPE

EFFICIENT—ELASTIC—ECONOMICAL

R. D. WOOD & CO., PHILADELPHIA

No. 3

Patented
Beware of
Unsafe
Infringing
Imitations

AKME CONSUMING FLUE

Highly recommended by Gas—Chemical—and Combustion Engineers for Gas Ranges, because it is the only safe and efficient flue to use.

Range Experts consider it a necessity for the more economical—safer—and better operation of gas ranges.

Keeps the Kitchen free of grease and the dirt it collects—Assures the proper oven draft being constant.

Prevents serious hazards caused by connecting Ranges to the outside or oven vents being open.

FLues in: Silver Finish, Black Japan, Whitegray Enamel

WORTH MANY TIMES THEIR COST

AKME FLUE, INC.
1517-27 Guilford Ave.,
Baltimore, Md.

They don't Advertise

Overcoats for Polar Bears or Coatings for CAST IRON PIPE

Neither needs them! "They raise their own." Cast Iron Pipe coats itself—with rust—and the march of the Centuries never matters after that.

And to this endless life we add, for the gas industry's profit—

Sizes as small as 1¼ and 2 inches—

Lengths as long as 30 feet, assembled—

Screw joints (no couplings) guaranteed to hold 100 pounds gas pressure.

We also make cast iron pipe in standard lengths of the B. & S., Plain End and Precalked Joint types. Sizes 1¼ through 8 inches. An extremely high-grade gas pipe at most attractive prices. Write for quotations and full data.

McWane Cast Iron Pipe Company

Birmingham, Alabama

819 Bankers Trust Bldg.
Philadelphia, Pa.

208 So. LaSalle St.
Chicago, Ill.

1807 Santa Fe Bldg.
Dallas, Texas

PACIFIC STATES CAST IRON AND PIPE COMPANY, PROVO, UTAH

608 Subway Term. Bldg.
Los Angeles, Calif.

611 Spalding Bldg.
Portland, Oregon

149 West 2nd South
Salt Lake City, Utah

Improved

IRON BORING OXIDE

Gas Purification at Lowest Cost

Our Improved Iron Boring Oxide will *remove* the largest amount of H_2S *at lowest cost.* It has earned an enviable reputation for its *low resistance to flow of gas,* and uniform purifying value at different stages of its active life as well.

The outstanding features of Improved Iron Boring Oxide are

ACTIVITY—ENDURANCE
REVIVABILITY

Let Us Help Solve Your Purifying Problems

GAS PURIFYING MATERIALS CO.

Foot of Halsey Street Long Island City, N. Y.

Branch Yard to Serve New England

Providence, Rhode Island

FLANGE END

VALVES

We can furnish Valves for working pressures up to 1200 lbs. per sq. in.

Send for Circular 5

The LUDLOW

VALVE MANUFACTURING COMPANY

TROY, N. Y.

New York 82 Gold Street | Boston Tremont Bldg. | Philadelphia Harrison Building

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RITER-CONLEY CO.

STEEL CONSTRUCTION

PITTSBURGH

STEEL PLATEWORK

FOR

THE GAS INDUSTRY

Gas Holders
Pressure Tanks
Steel Pipe
Steel Barges
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LEADING GAS COMPANIES USE LAMBERT METERS

All sizes up to 3,400 cu. ft. capacity

Meters
Diaphragms
Repairs
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Pumps
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Wet Meters
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LAMBERT METER CO.

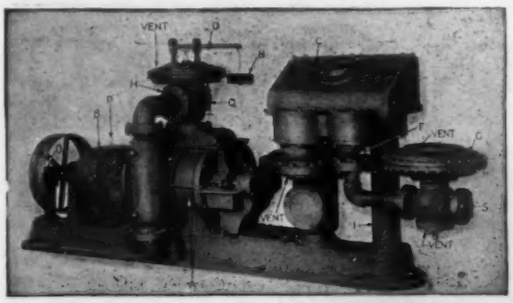
BUSH TERM. BLDG. 4, BROOKLYN, N. Y.

Low Temperature Carbonization of Bituminous Coals

Coal Conversion Corporation

285 Madison Avenue **New York**

THE IMPROVED KEMP SYSTEM



Opens up Bigger Opportunities for the use of Gas

For many years we have specialized in methods for greater efficiency in the utilization of gas for industrial heating operations. Through energetic research we have found opportunities for the use of gas, undiscovered by the average gas man. To meet the requirements of our findings, we have developed the improved Kemp Automatic Gas System, whereby improvements and economies can be realized that will be productive of a larger use of gas and prove satisfactory to both user and gas company alike.

Send for new descriptive catalog, or, better still, request one of our engineers to call—it will not obligate you.

THE C. M. KEMP MFG. CO.

405-415 East Oliver Street Baltimore, Md.

ISBELL-PORTER COMPANY

Engineers and Contractors for Complete Gas Works

I-P Co.

Manufacturers of All Kinds of Gas Apparatus

NEWARK - NEW JERSEY

Specialists in Fire Clay Refractories
With Over 30 Years Experience

Fire Brick for oil fuel furnaces, boilers and metallurgical furnaces.

Tiles and blocks of special shape for all purposes.

Muffles and planches, Coal gas benches.

Brass furnace linings, Water gas linings, Cupola linings.

Clay and Silica Retorts and settings.

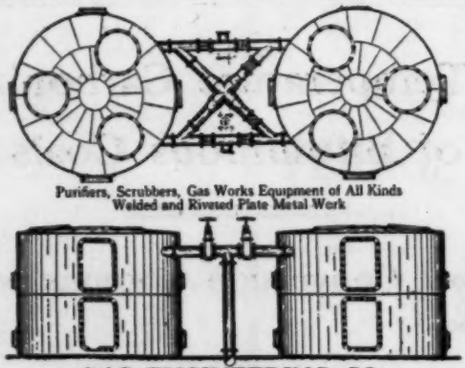
Ground fire clay, Ground fire brick, Plastic fire brick, Refractory Cements.

THE JERSEY CITY REFRACTORIES CO.

135 WEST SIDE AVENUE *A. E. ACHESON* JERSEY CITY, N. J.

Gas Holders
Gas Purifiers
Scrubbers
Condensers

PLATE METAL WORK RIVETED AND WELDED



Purifiers, Scrubbers, Gas Works Equipment of All Kinds
Welded and Riveted Plate Metal Work

GAS ENGINEERING CO.
TRENTON, NEW JERSEY

Apparatus for Making Coal Gas, Carburetted Water Gas, Hydrogen, Blue Water Gas, Producer Gas, Inert Gases

COMPLETE INSTALLATIONS

It's a mind-relief valve!

By relieving soaring pressures automatically, a Red Top Relief Valve Model No. 1 relieves the mind of all fears of explosions in domestic hot water supply systems. A home owner need not fear disaster as a result of neglecting to turn off a heater.

A Red Top works on the gravity principle, pressure in the system forcing a nickel-weighted piston off the seat. The lead ball in Model No. 1 is cast in four sections, allowing relief at 50, 75, 100 and 130 lbs. (It should be set at least 25 lbs. higher than city water pressure.)

Red Top bears the approval of the Underwriters' Laboratories, Inc., America's foremost testing organization.

Sectional View of Model No. 1

Neptune Meter Company,
50 E. 42nd St., New York City
Branch Offices in Principal Cities

Red Top Relief Valves

CINCINNATI

Overnight from nearly all cities

America's logical Convention City.

HOTEL GIBSON

1,000 Rooms, $2.50 Up

Cincinnati's Logical Convention Headquarters

2 Mammoth Ball Rooms Seating Over 1,000 Each
20,000 Sq. Ft. Foyer Space for Displays
Accommodations for More Than 2,500 Guests

WRITE FOR BOOKLET
RALPH HITZ, Manager

Russell Engineering Company St. Louis

Coal Carbonization Plants, Benches, Repairs, Improvements, Extensions, Apparatus

WESTMORELAND "CRITERION" GAS COAL

The Standard for Gas Making Since 1854

Since this Company commenced operations, its well-known Westmoreland "Criterion" Gas Coal has been largely used by the Gas Companies of Northeastern United States and Canada, and its character is established as having no superior in gas giving qualities and freedom from sulphur and other impurities.

Mines situated on the Pennsylvania Railroad,
in Westmoreland County, Pa.

THE WESTMORELAND COAL COMPANY

Principal Office, Lewis Building, 15th and Locust Sts., Philadelphia, Pa.

Shipping Ports: Philadelphia, Baltimore, South Amboy, N. J., Lake Ports.

Warren Foundry and Pipe Co.
11 Broadway, New York, N. Y.

—

MANUFACTURERS OF:

Cast Iron Water and Gas Pipe, Bell & Spigot-Flanged Pipe Castings

—

BOSTON OFFICE - 201 DEVONSHIRE ST.

The
SHELBURNE
"DIRECTLY FACING THE SEA"
ATLANTIC CITY

"European Plan"
Famous French Grill and Restaurant
"A rendezvous for those who seek the best"

MUSIC
SHELBURNE CONCERT ORCHESTRA
Proprietary-Management,
JACOB WEIKEL

"MON-O-FRAX"

High Temperature Cement

When quick repairs to retorts, boiler furnace walls and arches or hot packing are necessary "MON-O-FRAX" is unexcelled and easily applied. It is highly refractory and sets hard in air; can be used with first and second quality fire brick.

Shipped dry in cloth sacks

WALSH FIRE-CLAY PRODUCTS CO.
NEW YORK ST. LOUIS CHICAGO

Cox Gas Flow Computers

Low Pressures $3.50 each

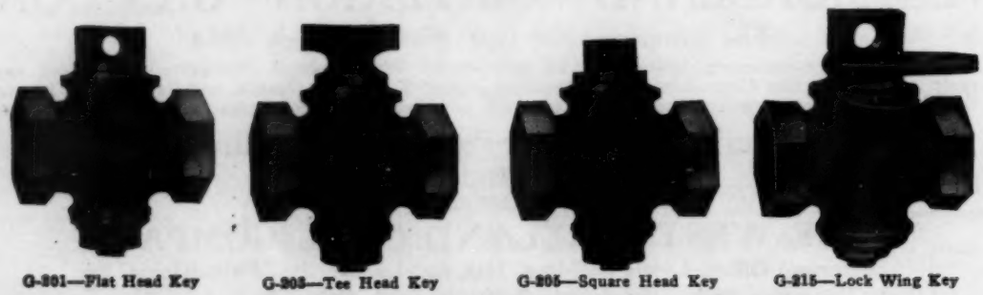
For sale by the American Gas Journal

LAVINO OXIDE

FOR GAS PURIFICATION

E.J. LAVINO AND COMPANY. BULLITT BLDG. PHILADELPHIA, PA.

Standard Flatway Meter Cocks



G-201—Flat Head Key G-203—Tee Head Key G-205—Square Head Key G-215—Lock Wing Key

Extra Heavy Gas Cocks

G-401—Flat Head Key G-415—Lock Wing Key G-417—Flat Head Key High Pressure Cock G-515—Iron Body Gas Cock Long Wing, with Brass Key

KITSON COMPANY Westmoreland and Stokley Streets PHILADELPHIA, PA.

Sales and Engineering Service

A confidential service to Manufacturers, Inventors and others in the Gas and Electric Industry—Market Analysis—Consolidation—Financing. Utilities and other properties bought and sold on commission.

Clearing House for the Sale of Used Equipment.

CHARLES W. WARDELL

2401 Chestnut St. Philadelphia, Pa.

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WANTED—Man to take charge of coke sales department, Massachusetts company, to sell 25,000 tons of coke; territory 125,000 population. State age, experience and salary desired. Address C. S., care of American Gas Journal, 53 Park Place, New York City.

GAS RANGE SALESMAN to represent a complete line of gas ranges and broilers—both domestic and hotel lines. One experienced and having some acquaintance with West Shore Gas Companies in Illinois and Wisconsin preferred. Address Box 917, American Gas Journal, 53 Park Place, N. Y. City.

Where Executive and Skilled Worker May Meet

To the Gas Executive

To secure the right man for whom you are seeking, state your needs here and the man you want will quickly respond.

To the Skilled Worker

If you are looking for betterment, tell your wants here, with every confidence that they will become known to those you desire to reach.

POSITION WANTED

COMMERCIAL AGENT — Twelve years' experience in gas business; married; age 32 years; can furnish the best of references. Address Box No. 913, care American Gas Journal, 53 Park Place, New York City.

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FOR SALE — Second-hand Junkers Calorimeter, complete with all accessories, in good condition; and 1—24" connections U. G. I. Tar Extractor, capacity 6,000,000 cubic feet per 24 hours; in good condition; has been in use three years. Address Box 918, care American Gas Journal, 53 Park Place, N. Y. City.

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CONSULTING ENGINEER
POWERS THEATRE BUILDING
Grand Rapids Mich.

WILLIAM HUTTON BLAUVELT
CHARLES R. BELLAMY, Associate
Consulting Engineers
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Low Temperature Distillation, Utilization of Fuels
Examination and Operation of Properties
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GAS ENGINEER
Specialist in Ammonia Recovery
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Emaus Pipe Foundry
CAST IRON GAS & WATER PIPE
Donaldson Iron Co.
EMAUS, PA.
Manufacturers of CAST IRON PIPE & SPECIAL CASTINGS for WATER & GAS, also FLANGE PIPE & FITTINGS for same.

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Engineering and Management
Corporation
231 S. La Salle Street
Chicago
New York San Francisco

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Manufacturers of GOVERNORS, APPARATUS and EQUIPMENT
IRON Connelly Iron Sponge and Governor Co. SPONGE
New York, Chicago U. S. A.
USE THE BENEFIT OF 50 YEARS EXPERIENCE!

Buyers' Reference Index

See page 133 for advertisements of these products.

ACCUMULATORS—STEAM
Ruth's Steam Accumulator Co.
Semet Solvay Engineering Corp.
Smoot Engineering Corp
The Gas Machinery Co.
The U. G. I. Contracting Co.

AIR-LINE MASK.
The Safety Gas Main Stopper Co.

AMMONIA CONCENTRATORS
Bartlett-Hayward Co.
Cruse-Kemper Co.
The Gas Machinery Co.
Isbell-Porter Co.
Riter-Conley Co.
Semet Solvay Engineering Corp.
The Stacey Bros. Gas Const. Co.
The Stacey Manufacturing Co.
John S. Unger.
Western Gas Construction Co.

AMMONIA CONCENTRATED LIQUOR PLANTS
Semet-Solvay Engineering Corp.
Western Gas Construction Co.

AMMONIA PIPE
National Tube Co.

AMMONIA RECOVERY APPARATUS
Semet-Solvay Engineering Corp.
Western Gas Construction Co.

AMMONIA STILLS
Bartlett-Hayward Co.
Cruse-Kemper Co.
The Gas Machinery Co.
Isbell-Porter Co.
The Koppers Construction Co.
Riter-Conley Co.
Russell Engineering Co.
Semet Solvay Engineering Corp.
Stacey Bros. Gas Constr. Co.
The Stacey Mfg. Co.
John S. Unger.
Western Gas Construction Co.

APPRAISALS & INVENTORIES
The U. G. I. Contracting Co.

ASBESTOS PACKING
Safety Gas Main Stopper Co.

ASH STORAGE BINS
Semet-Solvay Engineering Corp.
Western Gas Construction Co.

AUTOMATIC RAILWAYS
C. W. Hunt Co., Inc.

BAGS
Connelly Iron Sponge & Gov. Co.
Rubber & Canvas Covered
Safety Gas Main Stopper Co.

BAROMETERS
Precision Ther. & Inst. Co.

BENCHES
The Gas Machinery Co.
The Improved Equipment Co.
Isbell-Porter Co.
The Jersey City Refractories Co., Inc.
Russell Engineering Co.
Semet Solvay Engineering Corp.
The Stacey Mfg. Co.
The U. G. I. Contracting Co.
Western Gas Construction Co.

BENCHES
Complete
Semet Solvay Engineering Co.
Walsh Fire-Clay Products Co.
West Gas Improvement Co.

BENZOL
Bartlett-Hayward Co.
Carl Still, Incorporated.
The Koppers Construction Co.
Semet Solvay Engineering Corp.
Western Gas Construction Co.

BLOWERS
The Connersville Blower Co.
P. H. & F. M. Roots Co.

BLOWERS & BOOSTERS
American Gas Furnace Co.
Gas Engineering Co.
The Gas Machinery Co.
P. H. & F. M. Roots Co.
Semet Solvay Engineering Corp.
The U. G. I. Contracting Co.
Western Gas Construction Co.

BLOW PIPES
American Gas Furnace Co.

BLUE GAS PLANT
Bartlett-Hayward Co.
Carl Still, Incorporated.
Gas Engineering Co.
The Gas Machinery Co.
The Improved Equipment Co.
Isbell-Porter Co.
Semet Solvay Engineering Corp.
The Stacey Mfg. Co.
The U. G. I. Contracting Co.
Western Gas Construction Co.

BOILERS—WASTE HEAT
Bartlett-Hayward Co.
Combustion Engineering Corp.
The Gas Machinery Co.
Isbell-Porter Co.
Russell Engineering Co.
Semet Solvay Engineering Corp.
The U. G. I. Contracting Co.
Western Gas Construction Co.
West Gas Improvement Co.

BRICK
Silica
E. J. Lavino & Co.
Walsh Fire-Clay Products Co.

BRICK, FIRE AND CHECKER
The Jersey City Refractories Co., Inc.
Russell Engineering Co.
Semet Solvay Engineering Corp
The U. G. I. Contracting Co.
Walsh Fire-Clay Products Co.
Western Gas Construction Co.

BRUSHES, PIPE CLEANING
Safety Gas Main Stopper Co.

B. T. U. INDICATORS
The U. G. I. Contracting Co.

BURNERS (Industrial)
Fuel
The C. M. Kemp Mfg. Co.
Roberts Gas Burner Co.

BY-PRODUCT PLANTS
Bartlett-Hayward Co.
Carl Still, Incorporated.
Internat'l Coal Carbonization Co.
The Gas Machinery Co.
The Koppers Construction Co.
Riter-Conley Co.
Semet Solvay Engineering Corp.
The U. G. I. Contracting Co.
Western Gas Construction Co.
West Gas Improvement Co.

CABLE RAILWAYS
C. W. Hunt Co., Inc.

CALORIMETERS
Alpha-Lux Company (Inc.).
American Meter Co.
Lambert Meter Co.
D. McDonald & Co.
Metric Metal Works

CARBONIZATION
Low Temperature
Internat'l Coal Carbonization Co.

CARBURETTED WATER GAS PLANTS
Semet-Solvay Engineering Corp.
Western Gas Construction Co.

CARS
C. W. Hunt Co., Inc.

CAST IRON FITTINGS
James B. Clow & Sons

CEMENTS
The Jersey City Refractories Co. Inc.
Russell Engineering Co.
Walsh Fire-Clay Products Co.

CEMENTS, ACID-PROOF
Quigley Furnace Spec. Co., Inc.

CEMENTS, FIREBRICK
Quigley Furnace Spec. Co., Inc.
Walsh Fire-Clay Products Co.

CEMENTS, HIGH TEMPERATURE
Quigley Furnace Spec. Co., Inc.

CEMENTS
Refractory
E. J. Lavino & Co.

CHARGING MACHINERY
Bartlett-Hayward Co.
The Gas Machinery Co.
Isbell-Porter Co.
Russell Engineering Co.
Semet Solvay Engineering Corp.
Western Gas Const. Co.

CHUTES
C. W. Hunt Co., Inc.

CLAMPS (PIPE)
S. R. Dresser Manufacturing Co.

COALS
North American Coal Corp.
Westmoreland Coal Co.

COAL GAS APPARATUS
Bartlett-Hayward Co.
Carl Still, Incorporated.
The Gas Machinery Co.
Isbell-Porter Co.
The Koppers Construction Co.
Russell Engineering Co.
Semet Solvay Engineering Corp.
The Stacey Mfg. Co.
The U. G. I. Contracting Co.
Western Gas Construction Co.

COAL & COKE BINS CASTINGS
Semet-Solvay Engineering Corp.
Western Gas Construction Co.

COAL AND COKE HANDLING MACHINERY
Bartlett-Hayward Co.
C. W. Hunt Co., Inc.
Dry Quenching Equipment Corp.
Isbell-Porter Co.
C. M. Keller
The Koppers Construction Co.
Riter-Conley Co.
Russell Engineering Co.
Semet Solvay Engineering Corp.
The U. G. I. Contracting Co.
Western Gas Construction Co.

COAL TAR PRODUCTS
Western Gas Construction Co.

COAL TUBS
C. W. Hunt Co., Inc.

COCKS
Meter
Kitson Company
Service
Kitson Co.

COKE CRUSHERS
C. M. Keller
Semet Solvay Engineering Corp

COMPUTERS
Heating Value
The U. G. I. Contracting Co.

CONDENSERS
Bartlett-Hayward Co.
Cruse-Kemper Co.
Gas Engineering Co.
The Gas Machinery Co.
Isbell-Porter Co.
Riter-Conley Co.
Semet Solvay Engineering Corp.
The Stacey Bros. Gas Constr. Co.
The Stacey Mfg. Co.
Western Gas Construction Co.
West Gas Improvement Co.
High Duty
The U. G. I. Contracting Co.

CONTRACTORS' TUBS
C. W. Hunt Co., Inc.

CONTROLS
American Gas Furnace Co.
Bartlett-Hayward Co.
The Gas Machinery Co.
Robertshaw Thermostat Co.
Semet Solvay Engineering Corp.
Smoot Engineering Corp.
The U. G. I. Contracting Co.
Western Gas Construction Co.

CONVEYORS
C. W. Hunt Co., Inc.
Isbell-Porter Co.
The Koppers Construction Co.
Semet Solvay Engineering Corp.

CONCENTRATORS AMMONIA
Bartlett-Hayward Co.
The Gas Machinery Co.
Isbell-Porter Co.
Semet Solvay Engineering Corp.

COOLERS
Semet-Solvay Engineering Corp.
Western Gas Construction Co.

COUPLINGS
Bartlett-Hayward Co.
S. R. Dresser Manufacturing Co.
National Tube Co.
P. H. & F. M. Roots Co.

CRUSHERS
C. W. Hunt Co., Inc.

CUTTING IN TEES
R. D. Wood & Co.

DERRICK—PIPE
Safety Gas Main Stopper Co.

DISCHARGING MACHINERY
Bartlett-Hayward Co.
Russell Engineering Co.

DRAFT GAUGES
Precision Ther. & Inst. Co.

DRIP PUMP BOX
C. M. Keller

ELECTRIC LOCOMOTIVES
C. W. Hunt Co., Inc.

ELEVATORS
Craig Ridgway & Son Co.

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Combustion
Bartlett-Hayward Co.
The Improved Equipment Co.
The Koppers Construction Co.
Russell Engineering Co.
Smoot Engineering Corp.
Consulting
Bartlett-Hayward Co.
William Hutton Blauvelt
The Koppers Construction Co.
Russell Engineering Co.
Semet Solvay Engineering Corp.
The U. G. I. Contracting Co.
George H. Waring
Contracting
Bartlett-Hayward Co.
Cruse-Kemper Co.
Gas Engineering Co.
Isbell-Porter Co.
The Improved Equipment Co.
The Koppers Construction Co.
Russell Engineering Co.
Semet Solvay Engineering Corp
The Stacey Bros. Gas Constr. Co.
The Stacey Mfg. Co.
The U. G. I. Contracting Co.
West Gas Improvement Co.
Designing
Western Gas Construction Co.

EXHAUSTERS
American Gas Furnace Co.
The Connersville Blower Co.
The Gas Machinery Co.
Isbell-Porter Co.
The Stacey Mfg. Co.
The U. G. I. Contracting Co.

FIREBRICK—CHECKER BRICK
The Jersey City Refractories Co., Inc.
Russell Engineering Co.
Semet Solvay Engineering Co.
The U. G. I. Contracting Co.
Walsh Fire-Clay Products Co.
Western Gas Construction Co.

FIREBRICK, CEMENT
Quigley Furnace Spec. Co., Inc.
Walsh Fire-Clay Products Co.

FITTINGS
Isbell-Porter Co.
The Gas Machinery Co.
Semet Solvay Engineering Corp.
The Stacey Mfg. Co.
U. S. Cast Iron Pipe & Fdy. Co.
Warren Foundry & Pipe Co.
Western Gas Construction Co.
R. D. Wood & Co.
Cast Iron
Cast Iron Pipe Publicity Bureau

FITTINGS, FLANGED
U. S. Cast Iron Pipe & Fdy. Co.

FITTINGS
Pipe
American Cast Iron Pipe Co.
Semet-Solvay Engineering Corp.

FIXTURES
General Gas Light Co.
Welsbach Co.

FLOORS, IRON, BRICK AND STEEL
Western Gas Construction Co

FLUE PIPE (Cast Iron Oval)
James B. Clow & Sons

FLUES (Consuming) for Gas Range
Akme Flue, Inc.

FORGES
American Gas Furnace Co.

FURNACES (Case Hardening)
Cyanide
Muffle
Oil Tempering
Oven
American Gas Furnace Co.

FURNACES (Case Hardening)
Gas Fired
Warm Air
Geo. D. Roper Co.

GAS ANALYSIS APPARATUS
American Meter Co.
S. R. Dresser Manufacturing Co.
Metric Metal Works
Precision Ther. & Inst. Co.
The U. G. I. Contracting Co.

GASKETS, ASBESTOS
Safety Gas Main Stopper Co.

GAS MASKS
Safety Gas Main Stopper Co.

GAS PLANTS, COMPLETE
Bartlett-Hayward Co.
Carl Still, Incorporated.
The Gas Machinery Co.
Gas Engineering Co.
The Improved Equipment Co.
Isbell-Porter Co.
Russell Engineering Co.
Semet Solvay Engineering Corp.
The Stacey Bros. Gas Const. Co.
The Stacey Mfg. Co.
The U. G. I. Contracting Co.
Western Gas Construction Co.
West Gas Improvement Co.

GAS TESTING APPARATUS
Alpha-Lux Company, Inc.
Lambert Meter Co.
Metric Metal Works
Pittsburgh Equitable Meter Co.
Precision Ther. & Inst. Co.

LOOKING BACKWARD 30 YEARS

The Use of Gas Has Increased 500% Since 1895

Notwithstanding the loss of a large percentage of gas lighting, the diversified use of gas for domestic and industrial purposes has very materially increased the sales per meter.

The peak demand load is constantly increasing and is of such a nature that volume, as well as pressure, is required for the best results.

From a study of the individual records of several hundred thousand meters, summarized according to the system of the

FOUR CARDINAL POINTS

it is very evident that meters with additional capacity for the volume required hold their proof far better and have a longer life than meters which are overloaded and overworked.

LOOKING AHEAD 30 YEARS

The Lifetime of Our Meters

We strongly urge the placing of meters of greater capacity and volume for domestic and industrial customers where surroundings and industry indicate a prospective increased use of gas.

Capacities at One-Half Inch Loss in Pressure

5-B Capacity	150 Cu. Ft. Per Hour	100-B Capacity	1,800 Cu. Ft. Per Hour
10-B Capacity	300 Cu. Ft. Per Hour	150-B Capacity	3,000 Cu. Ft. Per Hour
20-B Capacity	450 Cu. Ft. Per Hour	250-B Capacity	4,500 Cu. Ft. Per Hour
30-B Capacity	600 Cu. Ft. Per Hour	500-B Capacity	7,500 Cu. Ft. Per Hour
60-B Capacity	1,250 Cu. Ft. Per Hour		

19 Years Experience

With the B-Type Meter

1860 **67 Years in Boston** **1927**

Manufacturing the Glover Type Meters

NATHANIEL TUFTS METER WORKS

of

American Meter Company, Inc.

455 Commercial Street

Buyers' Reference Index

See page 133 for advertisements of these products.

Superior Meter Co.
The U. G. I. Contracting Co.

GAUGE BOARDS
Western Gas Construction Co.

GAUGES
American Meter Co.
The Bristol Co.
Connelly Iron Sponge & Gov. Co.
Helme & McIlhenny
Lambert Meter Co.
Maryland Meter Works
Metric Metal Works
Safety Gas Main Stopper Co.
Pressure-Recording
D. McDonald & Co.
Superior Meter Co.

GLOVES
Rubber
Leather
Safety Gas Main Stopper Co.

GOVERNORS
The Stacey Mfg. Co.
Automatic
Chaplin-Fulton Mfg. Co.
Connelly Iron Sponge & Gov. Co.
Pittsburgh Equitable Meter Co.
Coke Oven
Chaplin-Fulton Mfg. Co.
Connelly Iron Sponge & Gov. Co.
The Gas Machinery Co.
The Koppers Construction Co.
Pittsburgh Equitable Meter Co.
Semet Solvay Engineering Corp
Smoot Engineering Corp.
District
Chaplin-Fulton Mfg. Co.
Connelly Iron Sponge & Gov Co.
Groble Gas Regulator Co.
Helme & McIlhenny
Isbell-Porter Co.
Pittsburgh Equitable Meter Co.
Reynolds Gas Regulator Co.
Semet Solvay Engineering Corp.
Smoot Engineering Corp.
Exhauster
Chaplin-Fulton Mfg Co.
Connelly Iron Sponge & Gov. Co.
The Connersville Blower Co.
Isbell-Porter Co.
Pittsburgh Equitable Meter Co
Smoot Engineering Corp.
High Pressure
Chaplin-Fulton Mfg. Co.
Connelly Iron Sponge & Gov. Co.
Pittsburgh Equitable Meter Co.
Reynolds Gas Regulator Co.
P. H. & F. M. Roots Co.
Smoot Engineering Corp.
The Sprague Meter Co.
Laboratory
D. McDonald & Co.
Low Pressure
Chaplin-Fulton Mfg. Co.
Connelly Iron Sponge & Gov. Co.
Pittsburgh Equitable Meter Co.
Reynolds Gas Regulator Co.
P. H. & F. M. Roots Co.
Semet Solvay Engineering Corp.
Smoot Engineering Corp.
The Sprague Meter Co.
Retort House
Chaplin-Fulton Mfg. Co.
Connelly Iron Sponge & Gov. Co.
The Gas Machinery Co.
Isbell-Porter Co.
Pittsburgh Equitable Meter Co.
Russell Engineering Co.
Semet Solvay Engineering Corp.
Smoot Engineering Corp.
Service
Chaplin-Fulton Mfg. Co.
Connelly Iron Sponge & Gov. Co.
Pittsburgh Equitable Meter Co.
Reynolds Gas Regulator Co.
Station
The Sprague Meter Co.
Chaplin-Fulton Mfg. Co.
Connelly Iron Sponge & Gov. Co.
Helme & McIlhenny
Pittsburgh Equitable Meter Co.
Reynolds Gas Regulator Co.
Semet Solvay Engineering Corp.
Station Automatic
Chaplin-Fulton Mfg. Co.
Connelly Iron Sponge & Gov Co.
Pittsburgh Equitable Meter Co.

GRAVITOMETERS
Precision Thermometer & Instrument Co.

HEATERS
House
Estate Stove Co.
Room
James B. Clow & Sons
Estate Stove Co.
General Gas Light Co.
Homestead Heater.
Welsbach Company

HEATERS (WATER)
Hot Water
The Cleveland Heater Co.
Electric Porcelain & Mfg. Co.
Kompak Company
Welsbach Co.
Fireplace
Grayson Mfg. Co., The J. H.
House
American Gas Products Corp.
The Cleveland Heater Co.
Garage
The Cleveland Heater Co.
Scientific Heater Co.
Room
Grayson Mfg. Co., The J. H.

HEATING MACHINES
American Gas Furnace Co.

HOISTS
C. W. Hunt Co., Inc.

HOLDERS
Bartlett-Hayward Co.
Cruse-Kemper Co.
Gas Engineering Co.
The Koppers Construction Co.
Riter-Conley Co.
The Stacey Bros. Gas Const. Co.
The Stacey Mfg. Co.
Western Gas Construction Co.

HOPPERS—COAL AND COKE
Bartlett-Hayward Co.
Cruse-Kemper Co.
Riter-Conley Co.
Russell Engineering Co.
Semet Solvay Engineering Corp.
The Stacey Mfg. Co.

HOTELS
Shelburne Hotel.
Hotel Gibson.

HYDROGEN GAS APPARATUS
Bartlett-Hayward Co.
Gas Engineering Co.
The Improved Equipment Co.
Semet Solvay Engineering Corp.
The Stacey Mfg. Co.

HYDROMETERS
Precision Ther. & Inst. Co.

INCINERATORS
Home Incinerator Co.

INDUSTRIAL FUEL APPLIANCE
American Gas Furnace Co.

INDUSTRIAL GAS MIXERS
Geo. D. Roper Corp.

INDUSTRIAL TRACK
C. W. Hunt Co., Inc.

INSTRUMENTS
The Bristol Co.
Metric Metal Works
Precision Ther. & Inst. Co.
P. H. & F. M. Roots Co.
The U. G. I. Contracting Co.
Recording
Alpha-Lux Company, Inc.
Superior Meter Co.

JOINTS
Semet-Solvay Engineering Corp.
U. S. Cast Iron Pipe & Foundry Co.
Insulating
Semet-Solvay Engineering Corp.
The U. G. I. Contracting Co.

JOINT RUNNERS
Safety Gas Main Stopper Co.

LAMPS
General Gas Light Co.
Kitson Co.
Welsbach Co.

LAMP POSTS
General Gas Light Co.
Kitson Co.
Welsbach Street Lighting Co. of America

MANILA & WIRE ROPE
C. W. Hunt Co., Inc.

MANTLES
General Gas Light Co.
Welsbach Co.

MASKS—GAS
Meiters
American Gas Furnace Co.
Connelly Iron Sponge & Gov. Co.
The Safety Gas Main Stopper Co

MAST & GAFF OUTFITS
C. W. Hunt Co., Inc.

MEASURING CHUTES
C. W. Hunt Co., Inc.

METERS
Air
American Meter Co.
The Connersville Blower Co.
John J. Griffin & Co.
Lambert Meter Co.
D. McDonald & Co.
Metric Metal Works
Neptune Meter Co.
Pittsburgh Equitable Meter Co.
P. H. & F. M. Roots Co.
The Sprague Meter Co.
Superior Meter Co.
Nathaniel Tufts Meter Works
The U. G. I. Contracting Co.
Artificial
American Meter Co.
John J. Griffin & Co.
Helme & McIlhenny
Lambert Meter Co.
Maryland Meter Works
D. McDonald & Co.
Metric Metal Works
Neptune Meter Co.
Pittsburgh Equitable Meter Co.
The Sprague Meter Co.
Superior Meter Co.
Nathaniel Tufts Meter Works
Demand
D. McDonald & Co.
Dry
American Meter Co.
Lambert Meter Co.
Maryland Meter Works
D. McDonald & Co.
Metric Metal Works
Pittsburgh Equitable Meter Co.
The Sprague Meter Co.
Superior Meter Co.
Nathaniel Tufts Meter Works
Natural Gas
American Meter Co.
The Connersville Blower Co.
John J. Griffin & Co.
Helme & McIlhenny
Lambert Meter Co.
Maryland Meter Works
D. McDonald & Co.
Metric Metal Works
P. H. & F. M. Roots Co.
Pittsburgh Equitable Meter Co.
The Sprague Meter Co.
Superior Meter Co.
Oil
Western Gas Construction Co.
Prepayment
American Meter Co.
John J. Griffin & Co.
Lambert Meter Co.
Maryland Meter Works
D. McDonald & Co.
Metric Metal Works
Pittsburgh Equitable Meter Co.
The Sprague Meter Co.
Superior Meter Co.
Nathaniel Tufts Meter Works
Station
American Meter Co.
The Connersville Blower Co.
The Gas Machinery Co.
John J. Griffin & Co.
Lambert Meter Co.
Maryland Meter Works
D. McDonald & Co.
Metric Metal Works
Pittsburgh Equitable Meter Co.
P. H. & F. M. Roots Co.
Superior Meter Co.
Nathaniel Tufts Meter Works
Steam
The U. G. I. Contracting Co.
Test
American Meter Co.
John J. Griffin & Co.
Lambert Meter Co.
Maryland Meter Works
D. McDonald & Co.
Metric Metal Works
Pittsburgh Equitable Meter Co.
The Sprague Meter Co.
Superior Meter Co.
Nathaniel Tufts Meter Works

METER CONNECTIONS
American Meter Co.
Bartlett-Hayward Co.
S. R. Dresser Manufacturing Co.
D. McDonald & Co.
Maryland Meter Works
The Sprague Meter Co.
Superior Meter Co.
Nathaniel Tufts Meter Works

MIXERS, GAS
The C. M. Kemp Mfg. Co.
Geo. D. Roper Corp.
Smoot Engineering Corp.

MOTOR CARS
C. W. Hunt Co., Inc.

NAPHTHALENE EXTRACTORS
Semet-Solvay Engineering Corp.
Western Gas Consruction Co.

OVENS COKE AND GAS
Carl Still, Incorporated.
The Gas Machinery Co.
The Improved Equipment Co.
The Koppers Construction Co.
Russell Engineering Co.
Semet Solvay Engineering Corp.
The U. G. I. Contracting Co.

OXIDE
Alpha-Lux Company, Inc.
Connelly Iron Sponge & Gov. Co.
Gas Purifying Materials Co., Inc.
E. J. Lavino & Co.

PACKING
Asbestos
Jute
The Safety Gas Main Stopper Co.

PAINTS
Jos. Dixon Crucible Co.
The U. G. I. Contracting Co.
Wailes Dove-Hermiston Corp.

PAINTS, ANTI ACID AND ALKALI
Quigley Furnace Spec. Co., Inc.

PAINTS
Graphite
Jos. Dixon Crucible Co.

PAINTS, RUSTPROOF
Quigley Furnace Spec. Co., Inc.

PHOTOMETERS (JET)
Connelly Iron Sponge & Gov. Co.

PHOTOMETERS
Lambert Meter Co.
The U. G. I. Contracting Co.
Warren Foundry & Pipe Co.

PIPE
Bartlett-Hayward Co.
National Tube Co.
Semet Solvay Engineering Corp.
The Stacey Mfg. Co.
R. D. Wood & Co.
U. S. Cast Iron Pipe & Fdy. Co.
Western Gas Construction Co.
Bell
Donaldson Iron Co.
Cast Iron
James B. Clow & Sons
Donaldson Iron Co.
McWane Cast Iron Pipe Co.
Flange
Donaldson Iron Co.
U. S. Cast Iron Pipe & Fdy. Co.
Spigot
Donaldson Iron Co.
Steel
Smith Corpn., A. O.
Welded Steel
The Stacey Mfg. Co.
Semet-Solvay Engineering Corp.

PIPE COATINGS
Wailes Dove-Hermiston Corp.

PIPE CUTTERS
Cast Iron Pipe Publicity Bureau
Ratchet
W. W. Strickler & Bros.

PRESSURE HOLDERS
The Stacey Bros. Gas Const. Co.

PLATES
Floor
Banner Iron Works
Cruse-Kemper Co.
Gas Engineering Co.
Riter-Conley Co.
Russell Engineering Co.
The Stacey Mfg. Co.

PLUGS SERVICE AND MAIN
Rubber
Soft Wood
The C. M. Kemp Mfg. Co.
Soft Wood
The Safety Gas Main Stopper Co.

PRODUCER GAS PLANT
Gas Engineering Co.
The Gas Machinery Co.
The Koppers Construction Co.
Riter-Conley Co.
Semet Solvay Engineering Corp.
The Stacey Mfg. Co.
R. D. Wood & Co.
The U. G. I. Contracting Co.
Western Gas Construction Co.

PROVERS—METER
American Meter Co.
Helme & McIlhenny
Lambert Meter Co.
D. McDonald & Co.
Pittsburgh Equitable Meter Co.
Superior Meter Co.

MARYLAND METER WORKS

OF

AMERICAN METER COMPANY

INCORPORATED

BALTIMORE MARYLAND

MARYLAND "C" TYPE METERS

Double the Hourly Capacity, with Slow Speed Operation

Increased Capacity.
Decreased Installation Cost.
Decreased Maintenance Cost.

Decreased cost for service connections per cubic foot capacity on completed installation.

Showing:
Enlarged valves with special guides; Compound levers for double diaphragms.

Showing:
Double diaphragms with equalizers.

The "C" METER is a NEW development in the larger sizes of THE MARYLAND "B" METER, with Tin Case and retaining the established principle for Positive Displacement Measurement in the two-diaphragm, slide-valve method of Operation.

THE MARYLAND "B" TYPE GAS METERS
THE MARYLAND "C" TYPE GAS METERS

Southern Representative
J. E. Montgomery, 1500 South Tenth Ave., Birmingham, Alabama

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PUMPS
Lambert Meter Co.
Superior Meter Co.
Drip
The Connersville Blower Co.
D. McDonald & Co.
George D. Roper Corp.
Gas Bag
The Safety Gas Main Stopper Co.
Hand
George D. Roper Corp.
Oil
The Connersville Blower Co.
D. McDonald & Co.
George D. Roper Corp.
Semet Solvay Engineering Corp.
Power
George D. Roper Corp.
Pressure
D. McDonald & Co.
Service
The Safety Gas Main Stopper Co.
Tar
The Connersville Blower Co.
D. McDonald & Co.
George D. Roper Corp.
P. H. & F. M. Roots Co.
Semet Solvay Engineering Corp
Vacuum
D. McDonald & Co.
Water
George D. Roper Corp.

PURIFIERS
Bartlett-Hayward Co.
Cruse-Kemper Co.
Gas Engineering Co.
The Gas Machinery Co.
Isbell-Porter Co.
The Koppers Construction Co.
Riter-Conley Co.
Semet Solvay Engineering Corp
The Stacey Bros. Gas Const. Co.
The Stacey Mfg. Co.
The U. G. I. Contracting Co.
Western Gas Construction Co.

PURIFYING MATERIALS
Alpha-Lux Company, Inc.
Connelly Iron Sponge & Gov. Co.
Cruse-Kemper Co.
Gas Purifying Materials Co., Inc
Lavino, E. J., & Co.

PURIFIER TRAYS
Bartlett-Hayward Co.
Cruse-Kemper Co.
The Gas Machinery Co.
Semet Solvay Engineering Corp.
The Stacey Bros. Gas Const. Co.
The Stacey Mfg. Co.
The U. G. I. Contracting Co.

PYROMETERS
Indicating
Recording
The Bristol Co.

RADIATORS
Gas Steam
Gas Water
James B. Clow & Sons

RANGES—GAS
A. B. Stove Co.
American Stove Co.
Electric Porcelain & Mfg. Co.
Geo. D. Roper Corp.
Tappan Stove Co.

REDUCED FITTINGS
R. D. Wood & Co.

REFRACTORY CEMENTS
Quigley Furnace Spec. Co., Inc.
Walsh Fire-Clay Products Co.

REFRACTORY GUN
Quigley Furnace Spec. Co., Inc.

REFRACTORY LININGS
Alpha-Lux Company, Inc.
The Gas Machinery Co.
The Jersey City Refractories Co. Inc.
E. J. Lavino & Co.
Russell Engineering Co.
Quigley Furnace Spec. Co., Inc.
Semet Solvay Engineering Corp.
The U. G. I. Contracting Co.
Walsh Fire-Clay Products Co.

REGULATORS
American Stove Co.
The Chaplin-Fulton Mfg. Co.
Connelly Iron Sponge & Gov. Co.
Isbell-Porter Co.
Groble Gas Regulator Co.
Minneapolis Heat Regulator Co.
Pittsburgh Equitable Meter Co.
Reynolds Gas Regulator Co.
Robertshaw Thermostat Co.
P. H. & F. M. Roots Co.
Semet Solvay Engineering Corp.
Smoot Engineering Corp.
The Sprague Meter Co.
The Wilcolator Co.

RETORT CEMENT
Alpha-Lux Company, Inc.
The Improved Equipment Co.
The Jersey City Refractories Co. Inc.
E. J. Lavino & Co.
Quigley Furnace Specialties Co., Inc.
Russell Engineering Co.
Walsh Fire-Clay Products Co.

RETORTS
The Jersey City Refractories Co., Inc.
E. J. Lavino & Co.
Riter-Conley Co.
Walsh Fire-Clay Products Co.
Horisontal and Inclined
Silica and Clay
The Gas Machinery Co.
The Improved Equipment Co.
Russell Engineering Co.
Walsh Fire-Clay Products Co.
Silica and Clay
The Gas Machinery Co.
The Improved Equipment Co.
The Jersey City Refractories Co. Inc.
Russell Engineering Co.
Walsh Fire-Clay Products Co.
Vertical
The U. G. I. Contracting Co.
West Gas Improvement Co.

SCALES
C. W. Hunt Co., Inc.

SCRUBBERS
Bartlett-Hayward Co.
Cruse-Kemper Co.
Gas Engineering Co.
The Gas Machinery Co.
Isbell-Porter Co.
The Koppers Construction Co.
Riter-Conley Co.
Semet Solvay Engineering Corp.
The Stacey Bros. Gas Constr. Co.
The Stacey Mfg. Co.
The U. G. I. Contracting Co.
Western Gas Construction Co.

SERVICE PLUG—RUBBER
The Safety Gas Main Stopper Co.

SKIP HOISTS
C. W. Hunt Co., Inc.

SPONGE
Alpha-Lux Company, Inc.
Connelly Iron Sponge & Gov. Co.
Gas Purifying Materials Co., Inc.
Lavino, E. J., & Co.

STATION METERS
American Meter Co.
The Connersville Blower Co.
The Gas Machinery Co.
Maryland Meter Works
D. McDonald & Co.
Metric Metal Works
Pittsburgh Equitable Meter Co.

STEAM ACCUMULATORS
The Gas Machinery Co.
Semet Solvay Engineering Corp.
Smoot Engineering Corp.
The U. G. I. Contracting Co.

STOPPERS
The Safety Gas Main Stopper Co.

STREET DEPT. EQUIPMENT
The Safety Gas Main Stopper Co.

STOVES—GAS
Electric Porcelain & Mfg. Co.
Geo. D. Roper Corp.

STREET LAMPS
General Gas Light Co.
Kitson Co.
Welsbach Street Lighting Co. of America

SYSTEMS
Combustion Control
The C. M. Kemp Mfg. Co.
Smoot Engineering Corp.

TACHOMETERS
Precision Ther. & Inst. Co.

TANKS
Bartlett-Hayward Co.
Cruse-Kemper Co.
Gas Engineering Co.
Riter-Conley Co.
Pittsburg Water Heater Co.
Semet Solvay Engineering Corp.
The Stacey Bros. Gas Constr. Co.
The Stacey Mfg. Co.
Western Gas Construction Co.
High Pressure
The Stacey Mfg. Co.

TAP, SOAP—BINDING
The Safety Gas Main Stopper Co.

TAR DISPLACEMENT SYSTEM
Semet-Solvay Engineering Corp.
Western Gas Construction Co.

TAR DISTILLING PLANTS
Carl Still, Incorporated.
Gas Engineering Co.
The Gas Machinery Co.
Riter-Conley Co.
Semet-Solvay Engineering Corp.
The Stacey Bros. Gas Const. Co.

TAR EXTRACTORS
Bartlett-Hayward Co.
Gas Engineering Co.
The Gas Machinery Co.
Isbell-Porter Co.
The Koppers Construction Co.
Semet Solvay Engineering Corp.
The Stacey Mfg. Co.
The U. G. I. Contracting Co.
Western Gas Construction Co.

TEMPERATURE CONTROLLING DEVICE
American Gas Furnace Co.
American Stove Co.
The Bristol Co.
Robertshaw Thermostat Co.
Spencer Thermostat Co.
The Wilcolator Co.

TEMPERING AND COLORING MACHINE
American Gas Furnace Co.

THERMOSTATS
The Bristol Co.
The Cleveland Heater Co.
Patrol Valve Co.
Robertshaw Thermostat Co.
Spencer Thermostat Co.
The Wilcolator Co.

THERMOMETERS
American Meter Co.
The Bristol Co.
Cooper Oven Thermometer Co.
Lambert Meter Co.
D. McDonald & Co.
Metric Metal Works
Precision Ther. & Inst. Co.
Semet Solvay Engineering Corp.
Superior Meter Co.

TOOLS, PIPE GANG
The Safety Gas Main Stopper Co.

TUBES, BOILER
National Tube Co.

TUB ELEVATORS
C. W. Hunt Co., Inc.

VACUUM GAUGES
Precision Ther. & Inst. Co.

VALVES
Bartlett-Hayward Co.
The Bristol Co.
James B. Clow & Sons
The Gas Machinery Co.
Isbell-Porter Co.
The Ludlow Valve Mfg. Co.
Merco Nordstrom Valve Co.
Metric Metal Works
Patrol Valve Co.
Semet Solvay Engineering Corp.
The Stacey Mfg. Co.
The U. G. I. Contracting Co.
Western Gas Construction Co.
R. D. Wood & Co.

VALVES—COAL AND ASH VALVES
C. W. Hunt Co., Inc.

WASTE HEAT BOILERS
Bartlett-Hayward Co.
The Gas Machinery Co.
Russell Engineering Co.
Semet Solvay Engineering Corp
The U. G. I. Contracting Co.
West Gas Improvement Co.
Western Gas Construction Co.

WATER GAS APPARATUS
Bartlett-Hayward Co.
The Gas Machinery Co.
Isbell-Porter Co.
Semet Solvay Engineering Corp
The Stacey Mfg. Co.
The U. G. I. Contracting Co.
Western Gas Construction Co.

WATER GAS GENERATORS
Semet-Solvay Engineering Corp.
Western Gas Const. Co.

WATER HEATERS
The Cleveland Heater Co.
Electric Porcelain & Mfg. Co.
James B. Clow & Sons
Gallaher Boiler Co.
Welsbach Co.

WEIGH LARRIES
C. W. Hunt Co., Inc.

YARN, CAULKING
The Safety Gas Main Stopper Co.

STATEMENT OF THE OWNERSHIP, MANAGEMENT, CIRCULATION, ETC., REQUIRED BY THE ACT OF CONGRESS OF AUGUST 24, 1912, OF AMERICAN GAS JOURNAL.

Published monthly at New York, N. Y., for October 1, 1927.

State of New York }
County of New York } ss.:

Before me, a Notary Public in and for the State and county aforesaid, personally appeared Stanton G. Krake, who, having been duly sworn according to law, deposes and says that he is the Business Manager of the American Gas Journal, and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management, etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, embodied in section 411, Postal Laws and Regulations, printed on the reverse of this form, to wit:

1. That the names and addresses of the publisher, editor, managing editor, and business managers are:

Name of Publisher—American Gas Light Journal, Inc., 53 Park Place, New York, N. Y. Editor—H. M. Riley, Flushing, N. Y. Managg Editor—None Business Managar—Stanton G. rake, 319 Washington Avenue, Brooklyn, N. Y.

2. That the owner is—Stanton G. Krake, 53 Park Place, New York.

3. That the known bondholders, mortgagees, and other security holders owning or holding 1 per cent or more of total amount of bonds, mortgages, or other securities are: None.

4. That the two paragraphs next above, giving the names of the owners, stockholders, and security holders, if any, contain not only the list of stockholders and security holders as they appear upon the books of the company but also, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting, is given; also that the said two paragraphs contain statements embracing affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner; and this affiant has no reason to believe that any other person, association, or corporation has any interest direct or indirect in the said stock, bonds, or other securities than as so stated by him.

STANTON G. KRAKE,
Business Manager.

Sworn to and subscribed before me this 27th day of September, 1927.

ROZELLE BONNAFT.

(Seal)

(My commission expires March 30, 1929.)

AMERICAN METER COMPANY

INCORPORATED

MEASUREMENT ENGINEERS

QUALITY METERS

TO MEASURE GAS IN
ANY QUANTITY

105 WEST 40th STREET
New York

5-A Meter

A-METERS

	Capacity at 0.5 in. differential
5-A	175 cubic feet per hour
10-A	375 cubic feet per hour
30-A	875 cubic feet per hour
60-A	1500 cubic feet per hour
150-A	3400 cubic feet per hour

B-METERS

	Capacity at 0.5 in. differential
5-B meter	150 cubic feet per hour
10-B meter	300 cubic feet per hour
20-B meter	450 cubic feet per hour
30-B meter	600 cubic feet per hour
60-B meter	1300 cubic feet per hour
100-B meter	1800 cubic feet per hour

5-B Meter

HELME & McILHENNY

OF

AMERICAN METER COMPANY
INCORPORATED

17th and Clearfield Streets
Philadelphia, Pa.

ESTABLISHED 1848

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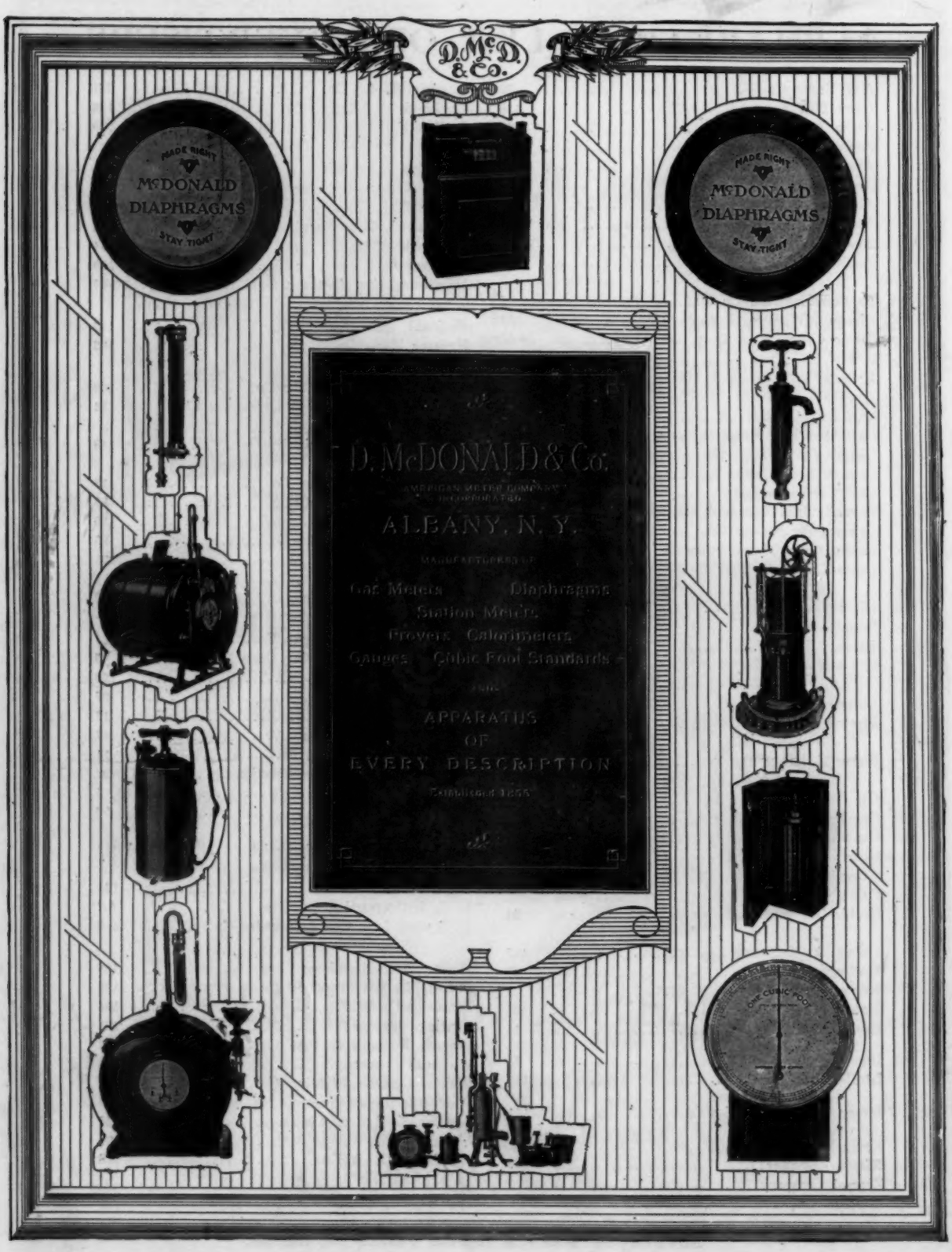
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